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Millions of Tons Needed . . .

Fertilizer Called Key to Winning India's Continual Battle for Adequate Food Supply

By Dr. Vincent Sauchelli

WHEN one thinks of the mighty forces being mustered by the world in the life or death struggle between Communism and democracy, one of the things least likely to come to mind is fertilizer. Yet this undramatic, non-political commodity may be an important factor affecting the way that struggle turns out.

Nowhere is this clearer than in India—next to China the nation with the largest population in the world, and the fulcrum in the battle be-

tween the Communist and democratic worlds.

Communism feeds on hunger, and India is hungry. Although four-fifths of its 431 million people are bound directly or indirectly to agriculture, a frightening proportion of them never get enough to eat. About 360 million Indians now live in some 560,000 squalid, primitive villages.

The Indian government is striving to industrialize the country, to create the jobs and wealth

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PRILLING TOWER—Manufacture of prilled ammonium nitrate is completed in the above facility at the Hopewell, Va., plant of Nitrogen Division, Allied Chemical Corp. Story of plant appears in this issue, page 4.

CAPITAL COMMENTS



Failure of Acreage Controls To Reduce Surplus May Bring Per Acre Yield Restrictions

By John Cipperly

Croplife Washington Correspondent

PROSPECTS for governmental control over the production of crops in terms of bushels or pounds per acre instead of the present acreage control system appear clearly in the cards. Under the present administration of the U.S. Department of Agriculture, this is the way the trend definitely points. Should this policy be translated into law, it would mean that price supports for wheat, cotton, corn, rice or peanuts would no longer be made on the basis of acreage, but on yields of these crops per acre as calculated against a recent acreage base.

Outturns in excess of the amounts arrived at from the recent acreage base would thus become the maximum quantity of the commodity available for price support. The amounts of pounds or bushels beyond this level would have to be sold on the open market.

Enactment of such legislation would come as no surprise to many in the fertilizer and pesticide industries who have kept informed on developments. Representatives of these industries, men who have kept alert eyes on developments, have consistently told Croplife that the failure of the price support programs, with or without acreage controls, would mean that the Freeman administration would press for acreage unit yields as a basis for price support.

Already in the feed grain program

and the new wheat program, the availability of government price support has been on the basis of normal yields to the acre and all produce harvested beyond those yields would have to be sold on the open market. The excess would thus be ineligible for price support.

Dr. Willard Cochrane, brain man of the Freeman operation, is a tough, intelligent and consistent individual, presently riding herd on USDA policy. His philosophy has been to control acreages through cash-on-the-barrelhead payments by the Federal Government for acreage cutbacks from a base period but, at the same time, he has apparently come to view

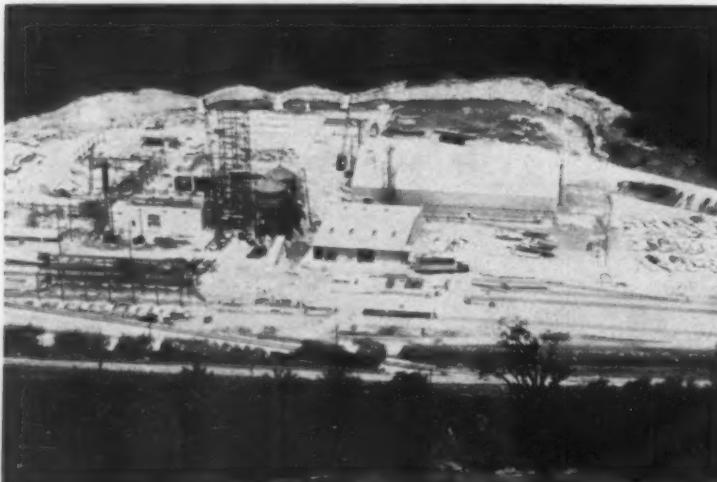
Turn to YIELD CONTROLS page 39

Progress Reported on New Nitrate of Potash Plant

Southwest Potash Corp., Division of American Metal Climax, Inc., New York, has reported that construction of its new \$7 million nitrate of potash plant at Vicksburg, Miss., is progressing on schedule. The final phase of construction, consisting of trial and startup operations, is scheduled for late 1961, the company says.

The Vicksburg operation marks the

initial venture of Southwest Potash Corp. into chemical production. The new plant will produce nitrate of potash and by-product chlorine. Nitrate of potash will be made by a new process developed by the company in cooperation with Jacobs Engineering Co. and the Colorado School of Mines Research Foundation, Golden, Colo.



CONSTRUCTION UNDER WAY—Aerial view of new \$7 million nitrate of potash plant under construction by Southwest Potash Corp. at Vicksburg, Miss. Trial and start-up operations are expected to get under way late this year, the company says.

K₂O Deliveries Down 16% in Fiscal Year, American Potash Institute Says in Report

Decrease of 16% in K₂O deliveries during the fertilizer year of July, 1960, through June, 1961, has been reported by the American Potash Institute which comprises eight American potash producers and importers.

According to the report issued Aug. 18, deliveries totaled 3,623,298 tons of salts containing an equivalent of 2,100,015 tons K₂O. The figure represents a loss of 15% in salts and 16% in K₂O under the preceding fertilizer year, API says.

The Institute presented the following statistics on deliveries of potash during the latest fiscal year:

Continental U.S. took 1,962,055 tons K₂O; Canada, 86,284 tons; Cuba, 11,227 tons; Puerto Rico, 19,905 tons and Hawaii, 20,544 tons K₂O. (These figures include imports of 275,786 tons K₂O for this period, a decrease of 10%.) Exports to other countries were 418,335 tons K₂O, an increase of nearly 10%. Deliveries of potash for non-agricultural purposes amounted to 143,163 tons K₂O, a decrease of over 7%, and were 5% of all potash deliveries.

Total deliveries for all purposes were 4,550,991 tons of salts containing an equivalent of 2,661,513 tons K₂O, a decrease of 12% in salts and over 12% in K₂O under the last year.

Illinois with 192,427 tons K₂O was the leading state for deliveries followed in order by Indiana, Georgia, Ohio, Florida and Virginia. Deliveries do not necessarily correspond to consumption in a given state, API notes.

Muriate of potash was the principal grade, comprising 93% of the total agricultural potash delivered. Of the

muriate, standard grade was 1,287,910 tons K₂O, while granular muriate was 1,054,548 tons, a decrease of over 18% in the standard and 7% in the granular grade under the preceding fertilizer year.

Sulphate of potash and sulphate of potash-magnesia accounted for 7% of agricultural deliveries.

New Ammonia Plant For Monsanto to Be Built in Iowa

Monsanto Chemical Co. announced on Sept. 1 that it will build an ammonia plant at Muscatine, Iowa.

Tom K. Smith, Jr., Monsanto vice president and general manager of the company's agricultural chemicals division, said that the new plant will add 200 tons a day to the ammonia production capacity of the company.

Construction of the facility will begin in October with completion scheduled for the fall of 1962, according to Mr. Smith.

The plant will be built adjacent to a 15,000-ton anhydrous ammonia terminal which Monsanto now has under construction at a site four miles south of Muscatine on the Mississippi River.

It will be Monsanto's third plant for the production of ammonia. The company currently makes ammonia in facilities at El Dorado, Ark., and Luling, La., the latter a computer-controlled plant.

Deliveries of Agricultural Potash Salts

July, 1960-June, 1961

Point of delivery	(In Tons of 2,000 lb. K ₂ O)				
	Standard	Granular	Manure salts	Sulphates	Total
Alabama	46,414.44	24,560.63	...	513.18	71,488.25
Arizona	81.00	22.20	...	1,175.55	1,278.75
Arkansas	5,846.26	38,306.33	4.33	193.65	44,350.57
California	8,863.00	2,999.00	...	8,383.68	20,245.68
Colorado	226.87	608.52	...	237.27	1,072.66
Connecticut	1,089.46	1,474.85	...	349.39	2,913.70
Delaware	2,247.73	4,636.16	...	127.16	7,011.05
District of Columbia	278.98	30.24	...	126.54	435.76
Florida	71,908.61	35,443.96	5.00	30,622.07	137,979.64
Georgia	90,038.09	43,485.23	...	9,174.66	142,697.98
Idaho	438.53	473.45	...	117.82	1,029.80
Illinois	47,940.94	143,359.89	...	1,126.62	192,427.45
Indiana	48,707.82	107,706.08	...	4,924.56	161,338.46
Iowa	11,433.50	48,464.70	...	243.66	60,241.86
Kansas	1,616.09	905.65	...	...	2,601.74
Kentucky	11,207.78	13,493.41	...	16,207.34	40,910.53
Louisiana	6,993.88	9,915.27	...	294.47	17,203.62
Maine	6,392.19	3,009.31	...	746.18	10,147.68
Maryland	40,940.59	24,633.79	...	3,944.77	69,519.15
Massachusetts	2,789.04	11,227.27	...	1,221.81	15,238.12
Michigan	20,827.66	43,668.82	...	1,140.12	65,634.60
Minnesota	8,679.32	53,229.18	...	528.03	62,438.53
Mississippi	10,419.03	27,202.40	...	617.72	38,239.15
Missouri	19,426.68	30,864.90	...	201.44	50,493.02
Montana	37.00	...	...	...	37.00
Nebraska	223.84	2,973.37	...	71.74	3,268.95
New Hampshire	45.65	...	...	...	45.65
New Jersey	17,840.31	10,745.81	9.00	1,555.74	30,158.88
New Mexico	84.68	111.00	11.33	1,308.07	1,515.08
New York	11,529.97	20,885.49	...	2,194.31	34,609.77
North Carolina	53,885.15	24,047.54	47.35	22,192.62	100,172.66
North Dakota	61.04	3,162.78	...	28.00	3,251.82
Ohio	59,389.82	77,842.36	...	3,990.42	141,222.60
Oklahoma	2,510.82	3,306.69	...	45.12	5,862.43
Oregon	515.00	4,185.54	...	507.65	5,208.19
Pennsylvania	15,048.77	17,041.62	...	1,613.23	33,703.62
Rhode Island	123.27	1,241.19	...	21.05	1,385.51
South Carolina	29,043.16	17,677.56	...	5,136.41	51,857.13
South Dakota	122.79	273.92	...	...	396.71
Tennessee	42,446.20	26,459.89	...	8,525.30	77,431.39
Texas	42,765.43	18,331.87	...	868.12	62,165.42
Utah	30.00	...	...	...	30.00
Vermont	1,289.49	1,909.10	...	...	3,198.59
Virginia	83,095.43	12,564.26	...	19,164.42	114,824.11
Washington	993.00	6,748.94	...	1,150.62	9,092.56
West Virginia	469.58	430.68	...	9.76	910.02
Wisconsin	22,754.90	41,120.34	...	969.83	64,845.07
Wyoming	...	24.00	...	...	24.00
Total continental U. S. . .	849,275.14	961,130.84	77.01	151,572.12	1,962,055.11

Imports (153,503.17) (42,134.78) (39,046.35) (234,706.30)

NOTE: Import figures given in parentheses are included in all totals.



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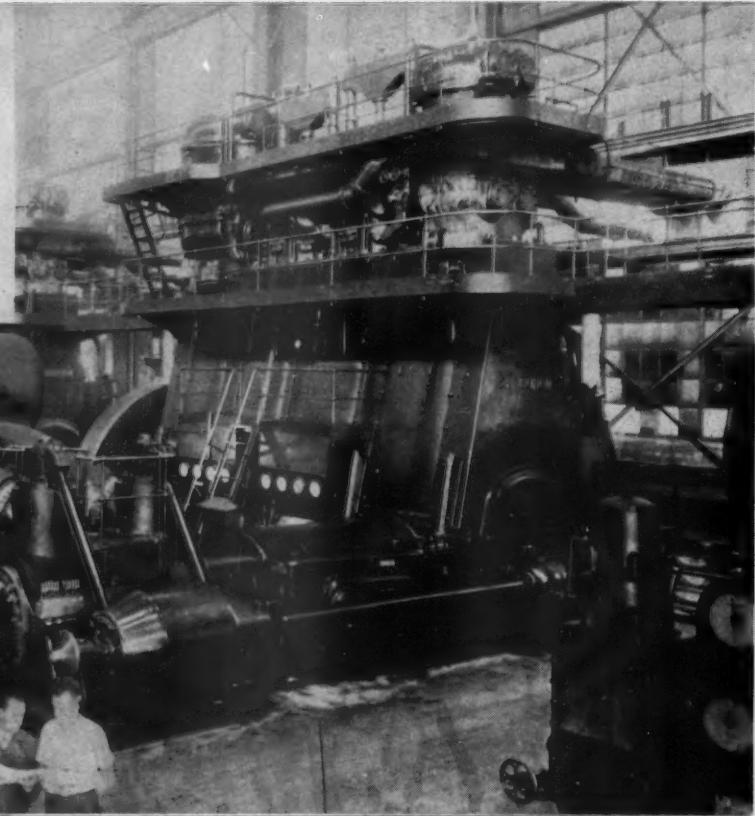
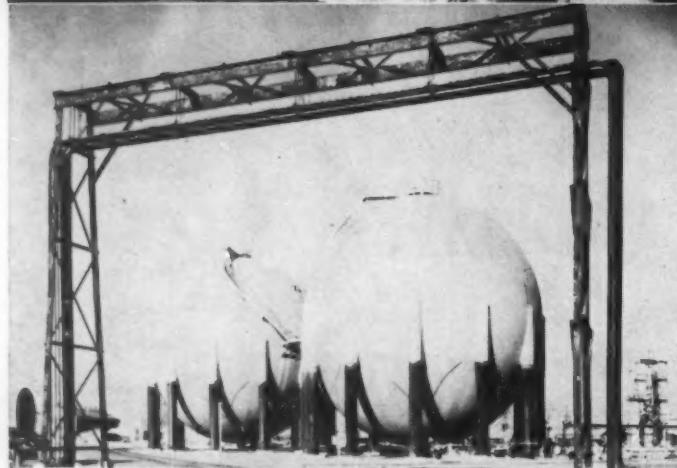
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Allied Ammonia Plant Claims Many 'Firsts'



APIONEER nitrogen plant, which has not totally shut down since it went on stream some 33 years ago, has maintained a production record unequaled in the world. The plant, owned and operated at Hopewell, Va., by the Nitrogen Division of Allied Chemical Corp., produces sodium nitrate, ammonium nitrate, ammonia, and nitrogen solutions for the fertilizer industry.

The Hopewell plant started operations in late 1928. It was the largest ammonia plant and first synthetic sodium nitrate plant to be built and was watched closely by the trade to see how its many innovations and new processing ideas would work in actual practice.

Nitrogen Division first introduced nitrogen solutions to the trade in 1933 and this phase of the business has continued to increase in all the years since that time.

During the years of World War II, however, the plant was practically a captive of the government, which needed nitrates in huge quantities for explosives. In 1942 the government purchased every bit of production. There were no private sales made at that time.

Other nitrogen plants had been started by Allied Chemical in the states of Kentucky and Ohio, but none was ready for operation at the beginning of the war. Thus, the Hopewell plant did no normal business in those years until 1943 when newer plants came on stream and the Hopewell plant was able once more to supply nitrogen for agricultural use. Crops needed nitrogen badly, since most of the supply had been cut off. The demand was tremendous at that time.

Washington was concerned that enemy bombers might attack the Hopewell plant, attempting to put it out of business. Government officials wanted to put thick bomb walls around the entire plant, but this plan proved to be too gigantic for even the government to undertake. Another problem of the time was the emission of a plume of nitrogen oxides, which could be

Turn to AMMONIA PLANT page 40

AT HOPEWELL PLANT—Top photo: Line of main gas compressors at Nitrogen Division's plant at Hopewell, Va. At right is scene in bagged ammonium nitrate storage building and ammonia Hortonspheres on plant grounds. Below is aerial view of general layout, showing major portion of plant's 600-acre site.





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a
harvest
moon

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Pee-Cee-A is supplying potash for these fertilizers. It's gratifying to have helped in the production of a bountiful harvest.

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MEN MOVING AHEAD IN THE TRADE

Amoco Chemicals Corp., Chicago, has announced two appointments. Charles J. Wiley was named director of market research and William F. Christie was appointed eastern representative, market research and developments. Both announcements were made by George Bleger, manager of market research and development.

Mr. Wiley held previous technical and marketing positions with other chemical firms before joining Amoco recently. Mr. Christie joined Amoco in 1958. He takes his new position after being director of market research for Amoco. He will be located in New York.

F. G. Bemis, Jr., director of allied operations for the Bemis Bro. Bag Co., has been elected a vice president of the company. He will continue as director of allied operations, which entails responsibility for operation of the company's Visinet Mill, paper specialty and plastic packaging plants.

Mr. Bemis was appointed to the operations position in February, 1960, after serving two years as administrative assistant to the vice president in charge of research and development, and four years as manager of the Bemis bag plant at East Pepperell, Mass. He was elected to the company's board of directors in 1956.

Several personnel changes within Armour Agricultural Chemical Co. at Nashville and Memphis, Tenn., and Albany, Ga., were announced by H. V. Miller of Atlanta, vice president and general manager of the company's fertilizer division.

Robert A. Dillard, formerly plant manager at the Memphis fertilizer operation of the company, has been named plant manager in Nashville. He succeeded George C. York, who retired after 35 years of service with Armour.

Succeeding Mr. Dillard at Memphis is D. D. Spurlock, formerly assistant plant manager there.

J. P. Henley was named credit manager at the company's Albany division. He had been a salesman for Armour since 1950.

Judd H. Rose has been named advertising manager of Best Fertilizers Co., according to an announcement by Lowell W. Berry, company president.

Mr. Rose is a native of Boise, Idaho, where he was a former account executive for the Givens-Davies Advertising Agency. With that firm, he handled farm and industrial accounts. Later, he also worked for a steel fabricator with plants in Boise and Omaha, Neb.

At Best Fertilizers, Mr. Rose will handle duties including supervision of the firm's farm product advertising and dealer programs.

Herbert E. Weyrauch was named general manager of the Electronic Controls Division of Flo-Tronics, Inc., Minneapolis. William P. Edmunds has announced.

Mr. Weyrauch retains his former sales manager position in the Electronic Controls Division which designs and constructs automatic systems for material handling installations.

The appointment of Frank J. Ronan as vice president in charge of marketing for the Nitrogen Products Division, W. R. Grace & Co., was announced by William J. Haude, division president.

In this newly created position, Mr. Ronan will be responsible for coordinating all marketing and sales activities within the division. He will be located at the division headquarters in New York. He formerly served as general sales manager in Memphis, Tenn.

SunOlin Chemical Co. has announced appointments of three engineers at its Claymont, Del., complex. Bruce G. Hawthorn was placed in charge of the urea plant; Ernest Artz will head the ethylene oxide plant, and Donald R. Leamy will perform supervisory duties at the ethylene plant.

Mr. Hawthorn joined SunOlin in 1959; Mr. Artz in 1960; and Mr. Leamy more recently.

William A. Giffen, Clarksdale, Miss., has been named sales representative of the North Mississippi and Alabama district for Mid-South Chemical Corp., D. H. Bradford, Jr., vice president, has announced.

Mr. Giffen attended the University of Florida where he majored in transportation. He has had previous sales experience in the area and also farmed on a plantation in Clarksdale for seven years.



William A. Giffen

J. R. McCambridge has been appointed supervisor of technical sales activities for Chemagro Corp., Kansas City, Mo. He was formerly technical sales representative in the company's Western Region.

Jack Benham, field sales represent-

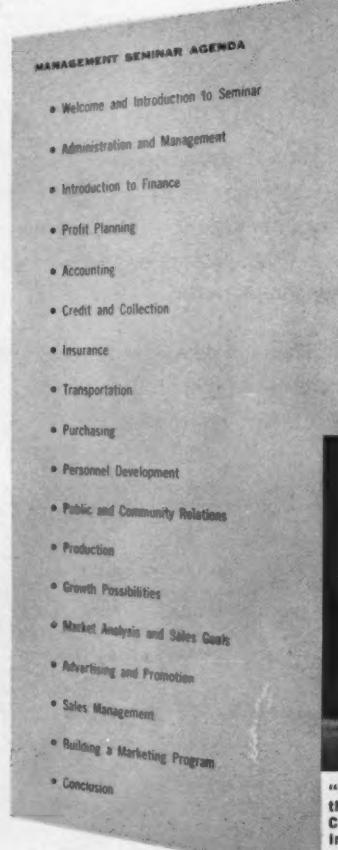
Reporting on IMC's second Fertilizer Management Seminar:

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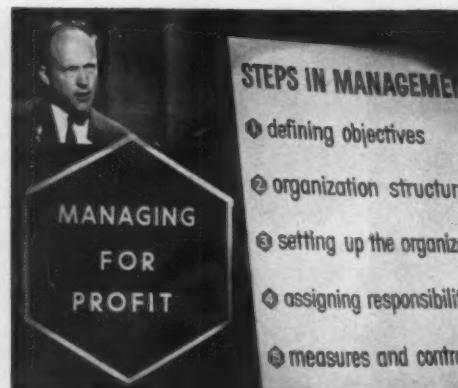
... unanimous opinion of over 60 fertilizer industry executives who attended IMC's pace-setting Full Orbit demonstration of total service to customers



Guest speaker John A. Baker, Director of Agricultural Credit said, "As your most important customers, farmers appreciate the continuing research conducted by the fertilizer industry, and the constant improvement in your products."



"Shirtsleeve" sessions took participants through complete set-up of the Makmor Company, an imaginary fertilizer company. Included management, sales, finance, market analysis, compensations. Typical is the market potential phase led by Anthony Cascine, IMC Marketing V.P.



No organization can have clear cut programs without definite objectives and rigidly defined responsibilities. Here R. J. DeLargay, V.P. of IMC's Technical Division, presents the fundamentals of managing for profit.

ative, San Mateo, Cal., has been transferred to Billings, Mont., and assigned to the new Montana-Northern Wyoming territory. Another change in the Western Region was the transfer of **A. E. Huckabee**, field sales representative, from the Central San Joaquin Valley to the Southern California sales territory, with headquarters at Whittier, Cal.

Four field sales representatives and four technical sales representatives have also been added to the expanded sales organization.

In the Western Region, new field sales representatives include **T. H. Hefferman**, Hanford, Cal.; and **John Lanigir**, San Mateo, Cal. New technical sales representatives are **Richard Williams**, Yakima, Wash.; and **Richard Hartmann**, San Mateo.

Additions to the Central Region include **H. P. Mikelson**, field sales representative, and **Lorne R. Dunham**, technical sales representative. Both are headquartered at Minneapolis, Minn.

J. H. Seale, Jr., joined Chemagro as a field sales representative in the Alabama-Tennessee sales territory, with headquarters at Greensboro, Ala.

In Canada, **Ross R. Lipsit** was named technical sales representative with headquarters in Toronto, Ont.

Harold A. Monsor, for the past two years production manager at Dorr-Oliver's Hazleton, Pa. plant, has assumed new duties as director of production—Stamford, Conn. He will have administrative responsibility for production and purchasing operations at Stamford, and for the company's manufacturing operations at Englewood, Colo.

Penco Division, Alan Wood Steel Co., has announced the appointments of **Carl B. Smith** and **Frank Spaniel** as general manager and general superintendent respectively of the Oaks, Pa. steel storage equipment company.

John W. Gilbert, Jr., has been named assistant director of research and **John A. Lyden**, assistant to the vice president in charge of manufacturing of International Paper Co. **Lamar M. Fearing**, president, has announced.

Mr. Gilbert, presently director of research for the company's Southern Kraft Division, joined the firm in 1936. In his new position, Mr. Gilbert will report to **Stuart E. Kay**, vice president and director of research.

Frank M. Cannon, Tenafly, N.J., has been named assistant Eastern regional sales manager of Owens-Illinois' paper products division. Mr. Cannon has been Eastern regional sales manager of the company's multiwall Bag Division.

B. J. Ainsworth, Fairfield, Conn., sales representative in the Multiwall Bag Division in the New York area since 1956, succeeds Mr. Cannon.



David K. Wilson

Justin Potter

David K. Wilson, Nashville, Tenn., has been elected chairman of the board of Virginia-Carolina Chemical Corp., Richmond, Va., succeeding **Justin Potter**, who will continue as president and chief executive officer. Mr. Potter emphasized that the action "will not change the direction of the company or its management."

Mr. Potter is chairman of the board of Cherokee Insurance Co., of which Mr. Wilson is president. Mr. Wilson has served as V-C director since January, 1958. He is an alumnus of Vanderbilt University and of Harvard University Business School.

The election of **T. D. Lyons**, comptroller of Allis-Chalmers Manufacturing Co., to the position of vice president, was announced recently by **R. S. Stevenson**, president.

Gerald D. Kelly, a district representative with Shell Chemical Company's agricultural chemicals division, has been assigned to the Yakima district office. He has been in the Pacific Coast district office, San Francisco, since joining the firm in 1959.

Dr. John R. Guttay, 37, a district agronomist with the National Plant Food Institute since 1958, has been appointed head of the plant science department at the University of Connecticut, Storrs. **A. N. Jorgensen**, president, announced.

Dr. Guttay fills the position vacated by **Prof. Howard A. Rollins** who retired Feb. 1 of this year. In the interim period **Prof. Benjamin A. Brown** has been serving as acting department chairman. Prof. Brown retires Sept. 10 after 42 years on the faculty. Dr. Guttay's appointment became effective Aug. 16. His duties will be to supervise and coordinate the department's research, teaching and extension programs in horticulture, agronomy, forestry and wildlife.

Charles A. Suter has been elected president of Geigy Chemical Corp., Ardsley, N.Y., succeeding **William F. Zipse**, president of the firm since 1943. Marking his 58th year of service with Geigy, Mr. Zipse now becomes chairman of the executive committee.

Mr. Suter had completed ten years with **J. R. Geigy, S. A.** in Switzerland prior to joining the U.S. company. Rising to vice president and director in 1943, he has been executive vice president since 1950.

W. W. Chadwick, New York regional sales manager of the materials department of International Minerals & Chemical Corp., has been promoted to manager of merchandising.

In his new job, he will direct sales training, sales compensation and incentives and related activities now performed in the merchandising department. In addition, he will assist in the development of marketing programs for the corporate operating divisions.

Turn to **MOVING AHEAD** page 41



Over 60 management representatives of the fertilizer manufacturing industry heard IMC Management officials outline and discuss the requirements for profitable management and selling.

Fertilizer company partners, presidents, general managers and other executives from all over the nation, took active part in IMC's highly successful "Managing for Profit" Seminar, July 19, 20 and 21 at Skokie, Illinois.

Top IMC management specialists — representing every important department of fertilizer operations — led practical discussions on a variety of subjects . . . ranging from "Introduction to Finance" through "Building a Marketing Program".

Objective of this Seminar — to help fertilizer management reduce in-plant processing costs, improve marketing and merchandising activities, manage for more volume and profit!

Your IMC representative can fill you in on all the information covered during the Seminar.

This IMC-sponsored conference is another example of the Full Orbit concept — a concept dedicated to **Total Service** in the fertilizer industry!



INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Agricultural Chemicals Division, Materials Dept. • Administrative Center • Skokie, Illinois



FO-2-2

Fertilizers for India . . . To Solve Food Problem

By Dr. Vincent Sauchelli

(Continued from page 1)

necessary for improving the standard of living. If it could develop a strong industrial base, India could afford to buy from other nations the feed it can not itself produce.

But industrialization takes a long time, and the people have to eat now. So the Indian government has been spending large sums of its scarce foreign exchange for buying food abroad, with the result that it has had less to spend for the machines needed to build industry—its ultimate salvation.

Many people in the U.S. believe that we should send (as we have) generous quantities of our surplus wheat and other foods to India to help solve her critical hunger problem. They see this as an effective way to stave off Communism there and in adjacent lands.

While these sentiments are easily understood, they miss the real point. What India really needs is not merely the short term palliative of emergency food shipments, but the means to grow her own food. The most valuable things we can give her are scientific knowledge, technical aid, and chemical fertilizers.

India is falling far short of reaching its agricultural potential. Although its population is enormous, it is not the most dense per square mile or per acre of cultivated land. With an average of 1.3 persons per acre of cultivated land, India is about on a par with Italy, and in a much better position—statistically—than Japan, with 6.1 persons, the Netherlands, with 4.1, or Belgium, with 3.7.

The average crop yields throughout India are generally inferior to those of advanced countries; rice yields are about the world's lowest. Yet field experiments by research institutions have demonstrated that modern management practices can double and even triple the yield of rice and other food grains.

There are many reasons for India's agricultural lag, including low-yielding crop varieties, primitive farm implements, animal power, inadequate capital, tradition-bound practices, heavy debt, insecurity of land tenure, inadequate diet, inertia and apathy.

Moreover, India is a "monsoon" country. Rainfall is concentrated in a few months, so that vast areas of the country can be profitably farmed only with proper irrigation.

But most basic of all is the depletion of the soil's native fertility. It can be said that the land of India is not overpopulated; rather, it is underfertilized. In fact, the amount of chemical fertilizers applied to India's farmlands is the lowest per acre in the world. It is not surprising that its average per acre yield of food grains is also one of the lowest.

Harvested crops in India remove a yearly average of about 8 million tons of plant foods, consisting of nitrogen, phosphate and potash. Replenishment in the form of chemical fertilizers and organic materials runs at only about 1.5 million tons a year, according to estimates made by the Fertilizer Assn. of India. The figures underline one of the main causes of India's low per acre yield. And they make it obvious that unless chemical fertilizers are used much more intensively to raise the level of soil fertility, the results of irrigation projects, bunding, terracing, developing new crop varieties, and using insecticides, etc.—necessary as these things are—will be disappointing. They can-

not produce the increased crop yields that can be produced by chemical fertilizers properly used.

Students of the problem in India have convincingly demonstrated with field experiments that one dollar spent for fertilizer could return four to five dollars in crop value. This is not extraordinary; it is a truism in our own country that a dollar invested in fertilizer can bring a \$3 to \$15 return, depending on the cash value of the crop.

To dramatically shake the Indian peasant out of his fatalistic resignation and lethargy, nothing could be more effective than a substantial increase in food grain yields. Commercial fertilizer could be the catalyst to do this.

Digging at the Roots

To some extent the U.S. government has recognized that, to really help India solve its food problem, we should do more than merely give her some of our surplus foodstuffs. In 1951 Congress authorized a Technical Cooperation Mission to help India solve its agricultural problems. This group of technicians has been doing splendid work in training personnel, demonstrating soil management practices and the proper use of fertilizers and insecticides, and breeding new and improved crop varieties.

Unfortunately, just recognizing the need for fertilizer doesn't in itself solve the problem. The Indian government is striving to become self-sufficient in food grains, and it recognizes the crucial role of fertilizer in reaching its goal. But its plans for increasing the use of fertilizer have been thwarted by its chronic lack of foreign exchange. This has held up construction of fertilizer plants, and crimped fertilizer imports.

The Third Five Year Plan (1961-1966) has set up a target of 1 million tons of nitrogen, 500,000 tons of phosphate (P_2O_5) and 200,000 tons of potash (K_2O). But realistic estimates indicate that these targets cannot possibly be met. Not more than 500,000 tons of nitrogen can be produced domestically by the end of the period, and present and proposed capacities of phosphate plants will be able to produce, at the most, only 296,000 tons.

Despite the efforts to reach its nitrogen production target of 382,000 tons at the end of the second Five-Year Plan in March, 1961, the goal was not achieved. Delays in completing three of the proposed plants were responsible.

Last February one of the key plants in India's Second Plan, Nangal Fertilizers, finally began trial operations. It is producing about 300 tons per day of calcium ammonium nitrate. The plant is on the Sutlej River, and is closely linked with the Bhakra-Nangal hydroelectric project. Vitro Engineering Corp. (New York) is the technical consultant. The fertilizer unit consists of air-liquefaction, ammonia, nitric acid and nitrolimestone plants. In addition to its fertilizer output, the complex is to produce 15 tons a year of heavy water for the atomic reactors at Trombay.

Among the proposed new plants of particular interest to Americans is the \$51-million unit to be built at Visakhapatnam, Andhra Pradesh, by International Minerals & Chemical Corp., California Chemical Co., both of the U.S., and Parry & Co., of Madras, India. It will be designed to produce urea and nitrophosphate with a nitrogen equivalent of about 80,000

PRODUCTION AND CONSUMPTION OF NITROGENOUS FERTILIZERS INDIA, 1951-52 TO 1960-61

in 1,000 Long Tons (2,240 Lb.) — N

First five-year plan (1951-56)	Production	Consumption	Consumption target
Fiscal year			
1951-52	10.3	57.7	.....
1952-53	44.4	54.7	.....
1953-54	63.9	84.1	.....
1954-55	68.0	96.4	.....
1955-56	78.6	109.2	380.0
Second five-year plan (1956-61)			
1956-57	78.4	123.0	.....
1957-58	76.6	147.6	.....
1958-59	77.4	162.8	.....
1959-60	75.2	216.4	.....
1960-61	76.8	236.2*	500.0

*Estimated.

Source: FAI Information Service, Vol. II, No. 8, dated April 16, 1961.

tons per year. The Caltex refinery at Visakhapatnam will supply naphtha, one of the raw materials.

The Trombay Fertilizers project was approved this year. It is to produce urea and nitrophosphate. The U.S. government has agreed to finance the entire cost, about \$58 million. The Chemical Construction Corp., New York, has won the machinery contract. Production is slated to start in 1963, but 1964 is probably a more realistic date.

Superphosphate production, meanwhile, increased only from about 9,000 long tons (P_2O_5) in 1951 to 58,000 long tons in 1960. Consumption in the 1960-1961 fiscal year totaled only 50,000 long tons—about one-third of the target. The record so far has been definitely disappointing.

Scarcity of sulfuric acid is held responsible for the production shortfall. Superphosphate producers own about 240,000 tons of sulfuric acid capacity, out of the country's total capacity of 375,000 tons. The government of India has licensed an additional 220,000 long tons. Still, it is unlikely that the Third Plan phosphate fertilizer target will be reached.

Filling the Gap

This record adds up to the fact that—unless some unexpected good fortune provides enough foreign exchange for the rapid construction of the fertilizer plants already approved or on the drawing boards—India will have to import a large part of its fertilizer requirements if it is to reach its food production goals.

This can mean enormous opportunities for foreign producers, particularly U.S. producers, who can benefit from the U.S. government's "Buy American" aid policy.

Taking advantage of this opportunity, however, can be a time-consuming, painstaking operation. Even though India's fertilizer needs are great, it still must be developed as a market; both the government and the peasants have to be sold on the wisdom of paying scarce money for fertilizer, and have to be taught how to use it.

A good example of such a program—and of its potential rewards—is the efforts of International Ore & Fertilizer Corp., the U.S. fertilizer trading company. Interore has established with its U.S. and foreign fertilizer suppliers two non-profit corporations in India. Their function is to promote the use of nitrogenous and phosphatic fertilizers, respectively, by selling government officials on their advantages and popularizing their use through grass-roots technical assistance.

The nitrogen fertilizer program—called the Kisan Khad Scheme of India—was set up four years ago by Interore and its European calcium ammonium nitrate suppliers—Austria's Stickstoffwerke, Germany's Ruhr-Stickstoff and Farbwere Hoechst, and Norway's Norsk Hydro-Electric. The success of the program

is reflected in Interore's calcium ammonium nitrate sales to India, which rose from 5,000 tons in the first year to an estimated 250,000 tons this year.

Besides convincing national and state government officials to purchase fertilizer, it is important to help them get the farmers to use it. There has been something of a "communications gap" between India's white collar government experts and the unlettered peasants. To help bridge this, Interore makes heavy use of well-illustrated pamphlets, printed in 16 languages. The program also uses technicians for field demonstrations. Besides selling the fertilizer, it is important to see that it is used correctly and not mishandled, checking on unloading from the ship, transport and storage.

The phosphate program, called Phosphate Scheme of India or Phoscheme, is backed by Interore and eight other U.S. companies: American Cyanamid, Armour, Davison, Swift, U.S. Phosphoric Products, International Minerals & Chemical, Virginia-Carolina Chemical, and F. S. Royster Guano. It was set up only about a year and a half ago, and at this stage is limited largely to selling government officials on the use of triple superphosphate.

Indian single superphosphate producers are now suffering from overcapacity, because consumption has not risen as much as planned. As a result, they have cut back on building, so that in two or three years demand will probably exceed local capacity. Phoscheme is trying to sell the government on importing triple superphosphate, both to fill the coming gap, and to spur present phosphate use. Indian farmers have been discouraged from using the locally produced superphosphate because of its high cost. The use of more economical triple superphosphate might encourage the use of all types, once farmers saw the results.

Need for Partnership

The potential for fertilizer consumption in India is enormous. To convert this to commercial reality will demand a vast effort in education, sales promotion, easing of credit and a substantial lowering of prices. (The cost of nitrogen and phosphate in India is the highest in the world.)

The government should spare no effort to increase indigenous production and imports during the next three years. This would help demonstrate the essential value of modern high-analysis fertilizers for increasing crop yields. It is important that the central government encourage more participation of the private sector. This it has not always done. For example, it would be a welcome change of policy if the government gave up its monopoly on distributing nitrogenous fertilizers and permitted private producers to market their own goods. It is axiomatic that he who makes a product has the greatest stake in marketing it.

Materials Handling, Dust Control, Safety Attitudes on Round Table Subject Agenda

Questions concerning production and management problems in the fertilizer industry will be answered by experts at the fertilizer industry Round Table meeting Nov. 8-10, according to tentative program plans just issued. Meeting headquarters will be at the Mayflower Hotel, Washington, D.C.

Dr. Vincent Sauchelli, Round Table chairman, is scheduled to open the sessions Wednesday morning, Nov. 8. A thorough discussion on materials handling, including a question and answer period, will follow during the remainder of the morning session. The feasibility of pneumatic handling of bulk solids and unloading cars will be discussed thoroughly, advance plans for the Round Table indicate.

The topic of materials handling will continue in the afternoon of Nov. 8, with a presentation by Arthur Sanders of the Scale Manufacturers' Assn. He will discuss fundamentals of weighing.

The handling of liquid materials will be covered in an afternoon session. Elmer Perrine, Nitrogen Division, Allied Chemical Corp., New York, will be moderator of the panel scheduled to answer questions regarding handling of anhydrous ammonia and solutions.

A review of phosphoric acid will be presented by Tom Martin, U.S.I. Division, National Distillers & Chemical Corp., and the subject of sulfuric acid will be handled by Frank Nielsson of International Minerals & Chemical Corp., Skokie, Ill. An additional presentation on how to inspire safety attitudes in production plant workers will be made by a representative of the National Safety Council.

The materials handling theme will be continued in a discussion planned for Thursday morning, Nov. 9. Frank Pocta, Shipping Bag Assn., will lead a panel to discuss bag construction, handling, bag closure and proper stowing of bags in cars and trucks for shipment. Continuing the theme, a discussion will be held on dust collection in the plant. Taking part in the panel discussion, according to the advance program, will be G. Schneider of Western Precipitation Co., and L. A. Eiben of Buell Engineering Co., Northern Blower Division. Both will present complete descriptions of their dust collection systems.

The ammoniation practices of the fertilizer industry will be reviewed during an afternoon session Nov. 9. Dr. A. B. Phillips, Tennessee Valley Authority, Wilson Dam, Ala., will present results obtained from a study of questionnaires returned by users of the TVA continuous ammoniator. The questionnaire was sent out some time ago by Croplife.

A panel discussion on the composition and uses of new materials used in fertilizer formulations will be featured on the final afternoon of the 1961 Round Table. Dr. T. P. Hignett, TVA, will be moderator of the panel which will discuss conventional, semi-granular, granular and bulk blending and the question of uniformity of product.

A review of conditioning agents in mixed fertilizers will be presented by Dr. John Hardesty, U.S. Department

of Agriculture, Beltsville, Md., scheduled on Friday afternoon.

According to Dr. Housden L. Marshall, secretary-treasurer of the Round Table, additional information will be forthcoming from panel leaders of the various sections on standardization and uniformity. Dr. Marshall said that final details of the Round Table will be ready for announcement a little later.

Members of the executive committee of the Round Table, in addition to Drs. Sauchelli and Marshall, are Joseph E. Reynolds, Jr., production manager of Davison Chemical Division, W. R. Grace & Co., Baltimore, and Albert Spillman, general manager, Fertilizer Manufacturing Cooperative, Inc., Baltimore.

SCREWWORM ERADICATION EFFORTS CONTINUE IN FLORIDA

Efforts to eradicate a localized outbreak of screwworm, discovered in northern Florida in June, are continuing, the U.S. Department of Agriculture reports. A major part of these efforts is the weekly release by air of a million sterile male screwworm flies into a 1,000-square-mile area of northwestern Florida and southeastern Alabama.

No new cases of livestock infested with this pest have been reported since June 27, but farmers in the area have been advised to keep their animals under close inspection and to report any infestations immediately.

The June outbreak, limited to farms within a 3½-mile radius in Holmes County, was the first established infestation found in Florida since the pest was eradicated during 1958-59 from its southeastern overwintering area. Cooperative efforts to eradicate the outbreak are being carried out by workers of USDA's Agricultural Research Service and of Florida, Alabama, and Georgia.

Eradication involves mass rearing and dispersal of screwworm flies made sexually sterile by exposure to gamma rays of cobalt-60. Eggs from native female flies that mate with the sterile males are infertile, and continued release of sterile flies into an infested region is expected to reduce the native screwworm population to zero.



Tennessee Farmers Cooperative supplies 40 counties from this modern plant at Lavergne, Tenn. Read below how this leading fertilizer manufacturer holds down corrosion with SPENSOL GREEEN*.

Major Tennessee Plant Food Supplier Relies On SPENSOL GREEEN Solutions

One of Tennessee's leading fertilizer manufacturers, Tennessee Farmers Cooperative operates three plants, all about 200 miles apart. TFC Plant No. 1 (above), which serves a large area in central Tennessee, has been expanded from its original 20,000-ton capacity to 50,000 tons.

The first plant in the state to use ammonium nitrate-urea solutions, the TFC operation at Lavergne has complete facilities for manufacturing, bagging, storing and

shipping mixed fertilizers and superphosphate. Like many progressive fertilizer producers, this Tennessee manufacturer relies on SPENSOL GREEEN corrosion-resistant Ammoniating Solutions.

Greatly improved corrosion control is yours at no extra cost when you specify genuine SPENSOL GREEEN. Thanks to its advanced corrosion inhibitor, SPENSOL GREEEN greatly prolongs the life of your manufacturing equipment.

Why not protect your valuable production and storage facilities by controlling corrosion damage with SPENSOL GREEEN? Extend the life of your tanks and pipe lines beginning now by making your next order genuine SPENSOL GREEEN Ammoniating Solutions. Contact your Spencer man right away — fast, dependable delivery from three strategically located plants.

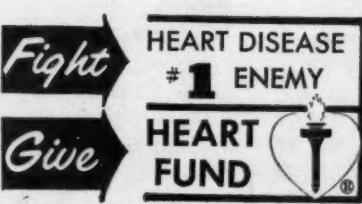
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Plans for \$10 Million Plant Announced by Swift, Skelly

Plans for a new \$10 million nitrogen plant to be built at Clinton, Iowa, have been announced by Swift & Co. and Skelly Oil Co. The two have formed a new Iowa corporation, known as the Hawkeye Chemical Co., to construct the facility. The new plant will have a capacity of some 300 tons a day. It will manufacture ammonia, nitric acid, nitrogen solutions, ammonium nitrate, urea and nitrate solutions, according to the joint announcement made late in August.

P. M. Jarvis, president of Swift & Co., and Don H. Miller, president of Skelly Oil Co., said that the new corporation will be owned on a 50-50 basis by the two companies.

The plant site is located about one mile southwest of Clinton, Iowa. Ample rail and highway transportation facilities are available to the new plant, the owners state. The main east-west line of the Chicago & Northwestern Railway forms part of the south boundary of the plant site, while the north-south Davenport,

Rock Island, and North Western Railway parallels the tract on its east side.

Highway facilities include U.S. 30, which is on the northern edge of the property and U.S. Highway 67 passes through the eastern portion of the site.

The joint announcement did not state when actual construction would begin, nor when the plant would be expected to go on stream. It will employ 150 persons when completed, the announcement said.

RETIRED ENGINEER DIES

Frederick Pope, 83, retired chemical engineer, died recently in Norwalk, Conn. He was a pioneer in building ammonia plants in the U.S. and other countries including Russia, China, Japan and India. He assisted in establishing the old Nitrogen Engineering Corp. which was later taken over by American Cyanamid Co. of which Mr. Pope became a director in 1929.

Suppliers Vie in Michigan Tournament

Michiana Chemical Co., Niles, Mich., recently conducted its first annual Spartan open golf tournament for its supplier salesmen. Thirty-five salesmen participated in the event.

Social gatherings were held at the homes of A. H. Oines, president of Michiana, and R. W. Freske, vice president. Aside from the golf tournament itself, the program included a breakfast, swimming, and a banquet in the evening, when prizes were awarded to golf winners.

Those honored with various prizes included the following: Low gross trophy, George Sherrill, Southwest Potash Co.; low net trophy, Phil

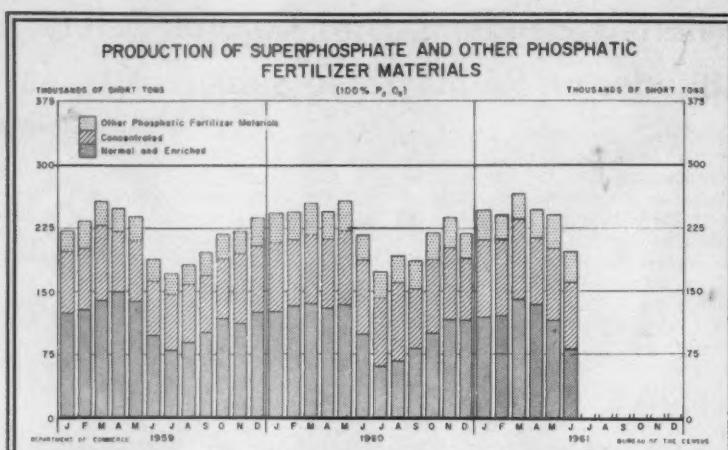
George, Allied Chemical Corp.; blind bogie, Fred Overton, American Cyanamid Co.; long ball on No. 1, Cecil Stonebraker, Allied Chemical Corp.; closest to the pin on No. 5, Don Kingsley, Virginia-Carolina Chemical Corp.; in-the-circle on No. 5, Dean R. Gidney, Potash Company of America; high gross, Bob Hall, U.S. Phosphoric Product Co.; first-for-breakfast, Ned Heydt, Raymond Bag Co.; most strokes on No. 9, John Baer, American Cyanamid Co.; high on any hole, Gordon DePew, American Cyanamid Co., and most beers on 4, 5 and 6, Dave Van Aken, Spencer Chemical Co.



AT MICHIANA EVENT—Pictured at recent "Michiana Open" golf tournament held at Niles, Mich., under the sponsorship of Michiana Chemical Co., were representatives of industry suppliers attending the festivities. Standing, left to right, are: John Anderson, American Potash & Chemical Co.; George Day, Standard Oil Co.; Russ Gulick, Potash Company of America; Ned Hett, Raymond Bag Co.; Fred Overton, American Cyanamid Co.; Bill Beers, New York Central Railroad Co.; Alf Oines, president, Michiana Chemical Co.; Charles Lockwood, New York Central R.R.; Dave Van Aken, Spencer Chemical Co.; Gordon DePew, American Cyanamid Co.; George Charbonneau, Spencer Chemical Co.; Leroy Hetler, Nitrogen Division, Allied Chemical Corp.; Austin Fox, American Cyanamid Co.; Dick Redie, Spencer Chemical Co.; Charles Leonard, American Cyanamid Co.; Bob Hall, U.S. Phosphoric Products; Don Kingsley, Virginia-Carolina Chemical Corp.; Bob Harper, Bradley & Baker; Ed Copp, Nitrogen Division, Allied, and Cecil Stonebraker, Nitrogen Division.

Seated are George Sherrill, Southwest Potash Corp.; Phil George, Nitrogen Division, Allied, and Charles Franklin, International Minerals & Chemical Corp. Also present, but not in photo, were Dean Gidney, Potash Company of America; Art Riddle, Bradley & Baker, and Woody Wilson, U.S. Borax & Chemical Corp.

Above at right: Winners of low gross and low net, respectively. They are George Sherrill, Southwest Potash Corp., left, and Phil George, Nitrogen Division, Allied.



SUPERPHOSPHATE DOWN—Production of superphosphate and other phosphatic fertilizer materials during June, 1961, amounted to 196,512 tons (100% P₂O₅), compared with June, 1960, output of 214,766 tons. Shipments were also down during the month as compared to the same period of 1960, according to a report prepared by the Bureau of the Census, U.S. Department of Commerce. Shipments totaled 100,308 tons, which was 6% under the volume shipped during June, 1960. The report states further that stocks held by producing plants as of June 30, 1961, totaled 382,126 tons, which was 23% more than those held on May 31, 1961. The above graph shows comparative figures for June and past months.

IMC to Hold Fertilizer Clinic Series

For the fourth consecutive season, International Minerals & Chemical Corp. will sponsor a series of cross-country training clinics this fall for customer companies. IMC has announced.

The 1961 series, "Total Service Selling," will take the program back into sales training after the special production and technical meetings held last fall. The meetings originally were requested by fertilizer companies as an aid to management in providing continuous training specifically for salesmen in the fertilizer industry.

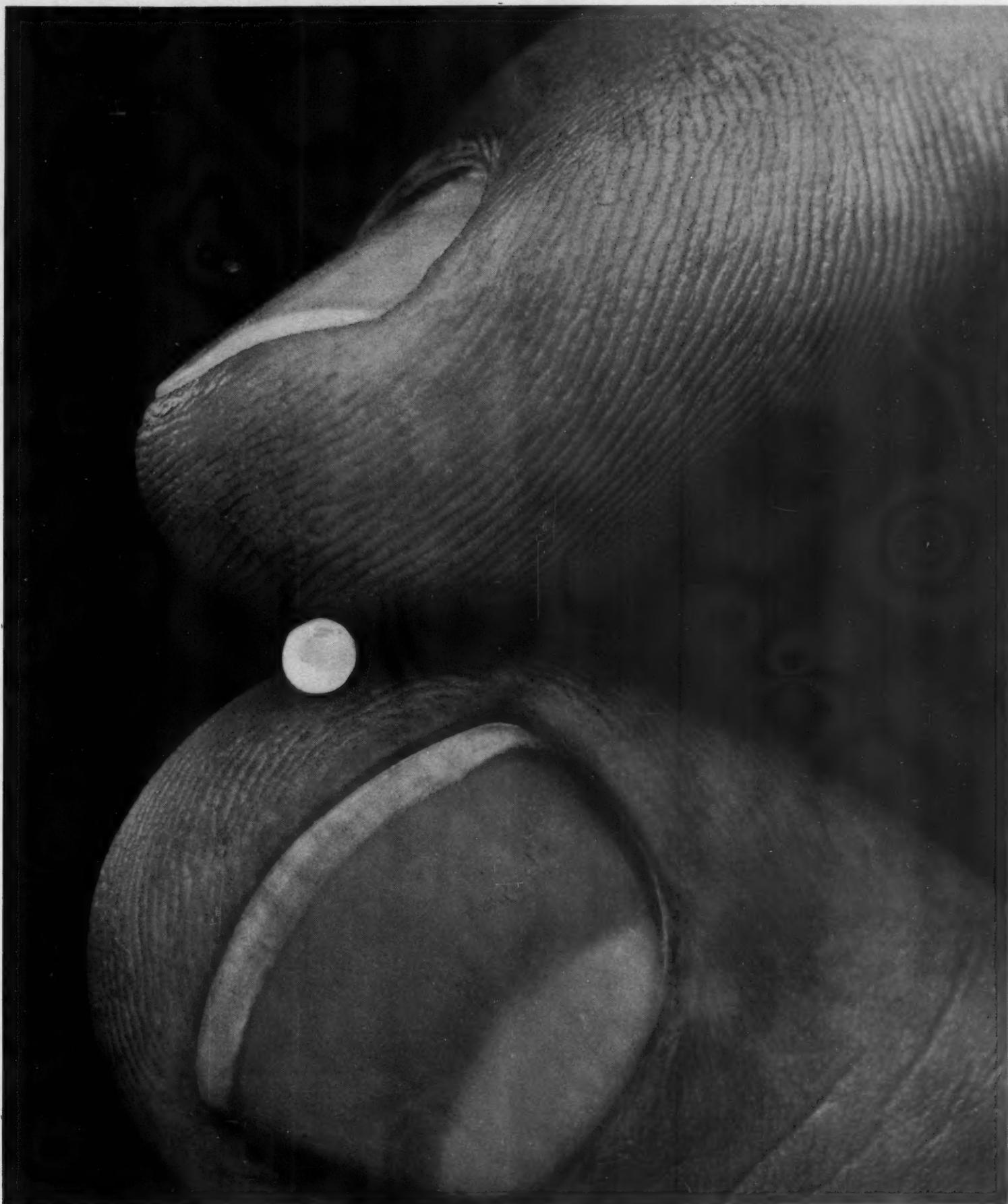
William W. Chadwick, IMC manager of merchandising, will direct the program and preside at all 10 meetings, which will open Oct. 4 in New York City and close Nov. 16 in New Orleans.

The complete schedule as announced by IMC is as follows:

- Oct. 4-5—New York City (Park Sheraton)
- Oct. 9-10—Baltimore (Lord Baltimore)
- Oct. 11-12—Raleigh (Plantation Inn)
- Oct. 16-17—Kansas City (Muehlebach)
- Oct. 23-24—Indianapolis (Marott)
- Oct. 25-26—Toledo (Secor)
- Oct. 30-31—Minneapolis (Pick-Nic-Ollet)
- Nov. 1-2—Macon (Dempsey Motor Hotel)
- Nov. 13-14—Dallas (Marriott Motor Hotel)
- Nov. 15-16—New Orleans (Royal Orleans)



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Belgian urea prills give you a guaranteed 46% nitrogen. The price per unit of nitrogen is comparable with competitive solid materials. What's more, the nitrogen is concentrated in a compact, uniform unit. Result? Excellent distribution. Easier handling. Substantial savings on transportation and storage.

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Is it any wonder H. J. Baker goes 3,000 miles to get them?

You can buy Belgian urea prills in America right now. In quantity. With fast delivery assured. As the first step in seeing how much better they can do

the job for you—and how much bigger they can make your profits grow—send for a free sample and complete information. Simply write to the H. J. Baker office nearest you.

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Individual Plant Worker Has Much to Gain By Heeding Safety Urging of Supervisors

By J. L. Shopen*

Safety Director
Consumers Cooperative Assn.
Kansas City, Mo.

WHEN a company or a single plant has made a fine record in safety, individuals in the plant may have a tendency to say to themselves, "Well, this is all fine and I am glad to be part of an organization that has made such a fine record, but what do I get out of it?"

This is an understandable attitude, even though a little on the selfish side. However, good safety records

are not achieved unless the men in the plant do watch out for each other and become in a sense, each other's keepers. Because of such a watchful attitude, many serious accidents are avoided and perhaps even some fatalities prevented over a period of time.

It is within the rights of every man to ask, "What's in it for me?" This is because every man must make provision for his family for the present time and for the years ahead. In matters such as purchasing a

home, putting away money for retirement, buying life insurance, or saving a little money, it is obvious that no one else will take care of these provisions for the man responsible for taking care of his family. Therefore, every man must think in terms of his own programming.

By the same token, a supervisor can work with his men in furnishing information as to how to safely perform a job. He can see that necessary protective equipment is available, but if the individual fails to follow through, the supervisor cannot do the job alone. These supervisors have many other functions to perform. But let's get back to the point: "What do I get out of it?"

If time and facilities were available, I think I could prove that from a money standpoint plant personnel derive a great deal of benefit personally by the prevention of accidents. If I were to ask, "Can you afford a Cadillac?" many would

chuckle. Yet, actual figures show that if an accident kept a man out of action for six months, the difference between his regular salary, plus the supplemental expenses which he would have, not covered by insurance, would cost as much as \$7,000—more than enough to buy an air-conditioned Cadillac!

Let me enumerate some of the side expenses which he would have. Most people have continuing monthly expenses. We are paying on a mortgage. We have car payments to meet. We are perhaps buying a refrigerator, a deep freeze, furniture, or something else. People who hold the mortgage on such items expect their payments. We cannot anticipate that they will be sympathetic in case of accident and say, "Well, we will just forget it until you are able to pay." No, these expenses must be met.

There are also additional expenses while in the hospital and while convalescing—such items as money spent for baby sitters, cab fare, flowers, and TV in the hospital.

Other items of cost which need to be explained: The average man spends \$75 a year for hunting, \$60 for fishing, \$39.50 for bowling, \$15 for baseball. But these pleasant expenses, of course, would have to be eliminated when an accident occurs.

The average American family also spends \$300 a year on vacation expenses. The tragic part of an accident is that the family is deprived of this benefit more than is the man involved.

American families spend \$225 a year on entertainment, items such as meals out, movies and entertaining. Also, the American family spends \$241 a year on cigarettes. Of course, when a man is hospitalized he might save this expense because as friends came in he could probably "mooch" cigarettes from them.

Therefore when we ask the question, "What do I get out of it?" we must come to the conclusion that the one who benefits most from the standpoint of accident prevention is the individual employee!

Most individuals cannot withstand the financial shock of a serious accident. Therefore it is up to each of us to more or less appoint ourselves a "safety committee of one" to make certain that the accident does not happen to us. If each continues that practice, safety in the plant can go from a good record to one of greatness.

A famous French writer coined a phrase of real significance . . . "Caution is the oldest daughter of wisdom." Caution in wearing needed safety equipment, caution in procedure, caution in all of our daily work activities, is the thing.

NFSA Secretary Joins Executive Group

W. Harold Schelm, executive secretary, National Fertilizer Solutions Assn., Peoria, Ill., has been admitted to membership in the American Society of Association Executives. It was announced by Glenn B. Sanberg, ASAE executive vice president, at the society's headquarters in Washington, D.C.

The nearly 2,000 association executives in the society represent more than 1,500 business, industrial and professional associations throughout the U.S. and many foreign countries.

Mr. Schelm was one of the men who helped form the NFSA and was named its executive secretary in April of this year. Prior to this, he headed his own manufacturing company which built tanks and application equipment used by the industry he now represents.

ENGINEER DIES

James B. Burris, 51, plant engineer for the Anderson Fertilizer Co., Anderson, S.C., died recently.

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Hi-Flo® Gran-U-Lated Triple Superphosphate . . . gives you Consistent Uniformity . . . and the famous Davison "plus" factors

Yes, Davison does give you something extra. In every field there is always one particular brand that is head and shoulders above competition. Davison's Hi-Flo Gran-U-Lated Triple enjoys that enviable spot in the phosphate field . . . a position it has earned through years of use. And you get a double guarantee. A guarantee of a minimum 46% APA . . . plus consistent uniformity of particle size, dust-free character and an ability to hold its shape without crumbling.

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Quality is still the most important thing . . . and you get it in Hi-Flo Gran-U-Lated Triple Superphosphate. But the extras you get from Davison . . . are like finding a pearl . . . in every oyster. Your Davison representative is probably in your area right now. If you want to see him immediately, simply phone SARatoga 7-3900.

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Hi-Flo® Gran-U-Lated Triple Superphosphate 46% APA • Hi-Flo® Run-O-Pile Triple Superphosphate 46% APA • Hi-Flo® Blend-Phos Triple Superphosphate 46% APA • Granulated Diammonium Phosphate 16-48-0 • Run of Pile Normal Superphosphate 20% APA • Granular Run of Pile Normal Superphosphate 20% APA • Granulated Normal Superphosphate 20% APA • Phosphate Rock—all grades and grits • Phosphate Acid—75% H₃PO₄—54.3% P₂O₅ • Sulfuric Acid—60° Be; 65° Be; 98% H₂SO₄ • Osmium—20% and 25%

New Booklet Gives Tips on How to Enter Tanks Safely

An eight-page pamphlet on recommended safe practices and procedures for entering tanks and other enclosed spaces is now available from the Manufacturing Chemists' Assn., Inc. This publication, 10th in MCA's "Safety Guide" series, emphasizes that hazards inherent in tank entry can be avoided or overcome by following three basic principles. They are:

"Establish a definite system of pre-planning for tank entry and a worker instruction program;

"Prepare the vessel for entry by

physically isolating it, cleaning it to remove contaminants, and testing it to insure absence of such contaminants;

"Use a formal permit system requiring written authorization for entry to be issued only after the supervisor in charge is satisfied personally with tank preparation, precautions to be taken, personal protective equipment to be used, and procedures to be followed."

Responsibility for safety, both at the time of entry and during the entire operation rests with the supervisor, the pamphlet states. Such responsibility also covers conditions of work for contractors' employees and

workmen from other divisions as well as for his own men, it points out. (The booklet, SG-10, is available from MCA, 1825 Connecticut Ave., N.W., Washington 9, D.C. Price: 30¢.)

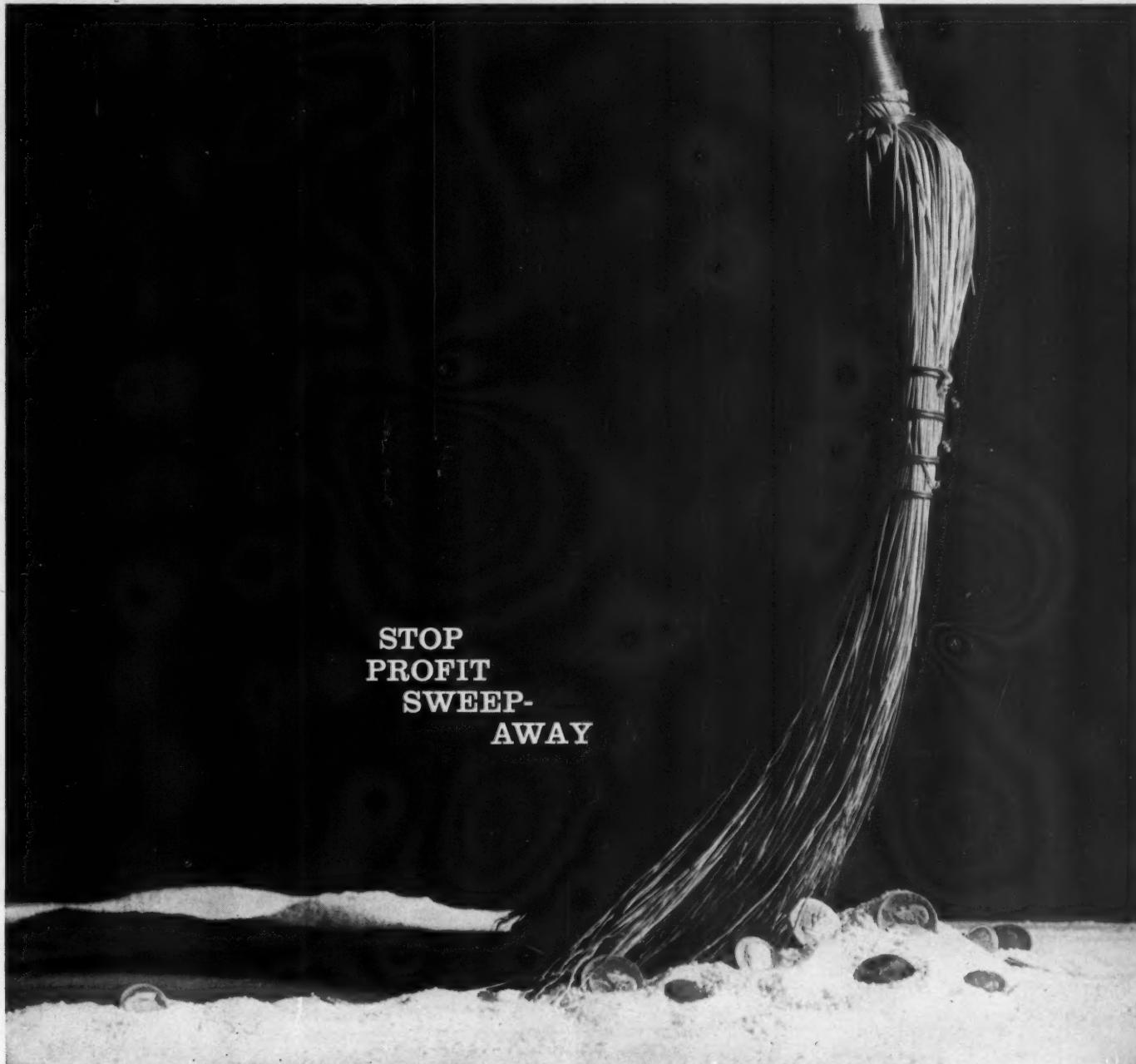
Conference Dates Selected

The 13th annual Pacific Northwest Regional Fertilizer Conference, sponsored by the Pacific Northwest Plant Food Assn. and the state agricultural institutions of Idaho, Oregon, Utah and Washington, will be held June 26, 27 and 28, 1962, at Walla Walla, Wash. The announcement was made by John Wilson, association manager, Seattle.

Mexican Meeting Dates Changed to Nov. 14-17

Meeting dates for the Mexican Assn. of Insecticide and Fertilizer Manufacturers have been set up one week to Nov. 14-17, according to Jack L. Schack, Montrose Mexicana, S.A., Mexico City. The original dates, one week later in November, were found to conflict with Thanksgiving Day observances, Mr. Schack said.

Place of the meeting will remain unchanged, he said. Convention headquarters will be Hotel La Perla, at La Paz, Lower California, Mexico, as announced in Croplife's August issue.



Save 10 to 20¢ per ton with St. Regis pasted valve bags

By switching to St. Regis® pasted valve bags, you can actually save up to 20¢ on every ton you pack, a cost reduction of from \$5 to \$10 per thousand bags.

Less expensive, more compact and stronger than sewn bags, these box-like packages are specially designed for easy palletizing. Thus, storing, handling and shipping costs are cut to a minimum. These bags also allow superior butt and edge printing for better brand identification.

You'll also want to look into another valuable packaging development from St. Regis—new Poly-Lok®, the polyethylene-film

valve insert that virtually ends bag leakage.

You can convert your present valve equipment from sewn to modern pasted bags simply and quickly. Your local St. Regis packaging engineer is a fertilizer packaging specialist—ready to help you.

Pasted valve bags are another example of St. Regis Packaging-in-Depth. This complete bag service assures you of the right bag, the right machinery to pack it, plus the services of highly-skilled engineers. To meet your future needs, this program also includes continued research to develop improved packaging methods and economies.



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PACKAGING-IN-DEPTH BY St. Regis BAG DIVISION

In Canada, contact St. Regis Consolidated Packaging Co., Ltd.

PAPER COMPANY

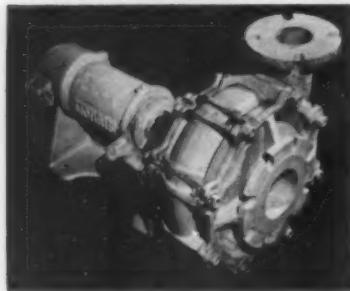
WHAT'S NEW

IN PRODUCTS • SERVICES • LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 9417—New Slurry Pumps

Morris Machine Works has added a new line of economical pumps. They are available in 11 models and



have standardized components allowing for alteration for repairs or quick changeover to another installation or application. For complete details and description check No. 9417 on the coupon and mail.

No. 9399—Duo-Purpose Broadcaster

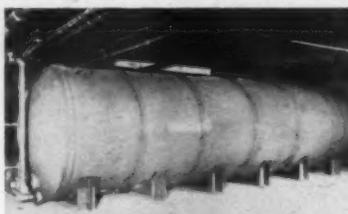
The Larson Machine Co. has introduced a duo-purpose broadcaster, for applying pellet type fertilizer. The company says the new mechanical design reduces operation failures and promotes longer life. New design of the agitator and hopper and wide-spread application are cited by the maker as important additional features. For complete information check No. 9399 on the coupon and mail.

No. 9422—Stainless Steel Meters

A new meter line has been developed by the Industrial Products Division of Badger Meter Manufacturing Co. According to the makers, the new meters are designed to reduce problems of measuring corrosive liquids. They are available in 1 in. and 2 in. sizes, with several different types of reading devices. For complete description and details check No. 9422 on the coupon and mail.

No. 9452—Bulk Storage Tank

The 6,500 gallon, fiberglass plastic tank pictured is one of a new line made by Jones & Hunt, Inc., for bulk storage or processing of corro-



sive liquids. According to the manufacturer, the insulating qualities of the wall material eliminate sweating and simplify temperature problems indoors or outdoors. The fiberglass plastic is said to resist corrosion, and requires no paint. For full information check No. 9452 on the coupon and mail.

Send me information on the items marked:

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|--|--|
| <input type="checkbox"/> No. 9342—Bag Packer | <input type="checkbox"/> No. 9442—New Piston Pump |
| <input type="checkbox"/> No. 9392—Portable Fabric Tank | <input type="checkbox"/> No. 9443—New Spreading Hood |
| <input type="checkbox"/> No. 9394—Broadcasting Plant | <input type="checkbox"/> No. 9444—Tractor-Shovel Unit |
| <input type="checkbox"/> No. 9399—Broadcaster | <input type="checkbox"/> No. 9445—Air-Blast Mist Sprayer |
| <input type="checkbox"/> No. 9400—Gyro Cooler Sifter | <input type="checkbox"/> No. 9446—Pneumatic Rippers |
| <input type="checkbox"/> No. 9417—New Slurry Pumps | <input type="checkbox"/> No. 9447—Phosphate Procedure |
| <input type="checkbox"/> No. 9418—Pilot Valve | <input type="checkbox"/> No. 9451—Dust Filter |
| <input type="checkbox"/> No. 9422—Stainless Steel Meters | <input type="checkbox"/> No. 9452—Bulk Storage Tank |
| <input type="checkbox"/> No. 9436—Cast Iron Engine | <input type="checkbox"/> No. 9453—Dry Processing Equip't |

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No. 9444—New Tractor-Shovel Unit

The Frank G. Hough Co. has announced a new series "B" version of its H-30 four-wheel-drive "Payloader" tractor-shovel. Although smallest in the manufacturer's four-wheel-drive line, the unit is now



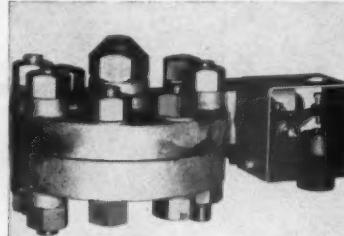
equipped with a 1½ cubic yard bucket. Ease of maintenance and accessibility have been given extra attention in the improved model, the maker says. It has dual foot brake pedals, and is available with either gasoline or diesel power. For further details check No. 9444 on the coupon and mail.

No. 9394—Granular Fertilizer Blending Plant

A new plant for the blending of dry fertilizer materials will soon be put on the market by Agricultural Business Company, Inc. Called the Agri-Blend Granular Fertilizer Plant, the plant is designed to store four or more granular fertilizer materials in Butler steel bins and mix these materials together at the rate of 15 to 30 tons per hour. All materials handling is accomplished by conveyors, legs or gravity. The company says that they will be able to erect such a plant, equipped with 800 tons of storage space, for approximately \$25,000. For more information, check No. 9394 on the coupon and mail.

No. 9418—Differential-Level Pilot Valve

Besler Corp. announces a new differential-level pilot valve, described as operating on the difference between two columns of liquid, usually



between a constant reference head and a variable head. The manufacturer says the principle can also be utilized with a steam trap to operate over a wide range of pressures. For further information and diagrams check No. 9418 on the coupon and mail.

No. 9453—Dry Processing Equipment

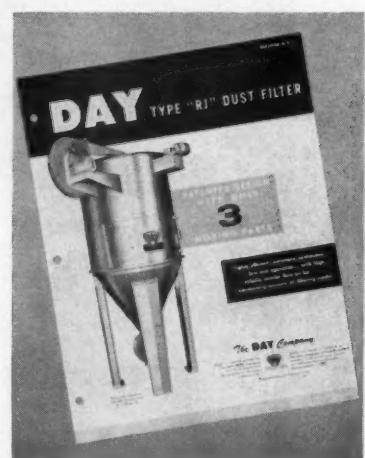
An eight-page bulletin on dry processing equipment is available from Sturtevant Mill Co. The literature discusses the company's full line of laboratory and production equipment. To obtain copy of the bulletin check No. 9453 on the coupon and mail.

No. 9436—Cast Iron Engine

A cast iron engine has been introduced to the liquid fertilizer industry by Clinton Engines Corp. It is described as a 3.25 horsepower, 4-cycle gasoline engine. It is shell-molded, and the makers say it was especially designed for the liquid fertilizer industry for pumping of complete-mix and aqua ammonia solutions. The motor is equipped with a horizontal crankshaft, and power take-off extensions are available to operate a pump. For further information check No. 9436 on the coupon and mail.

No. 9451—Dust Filter

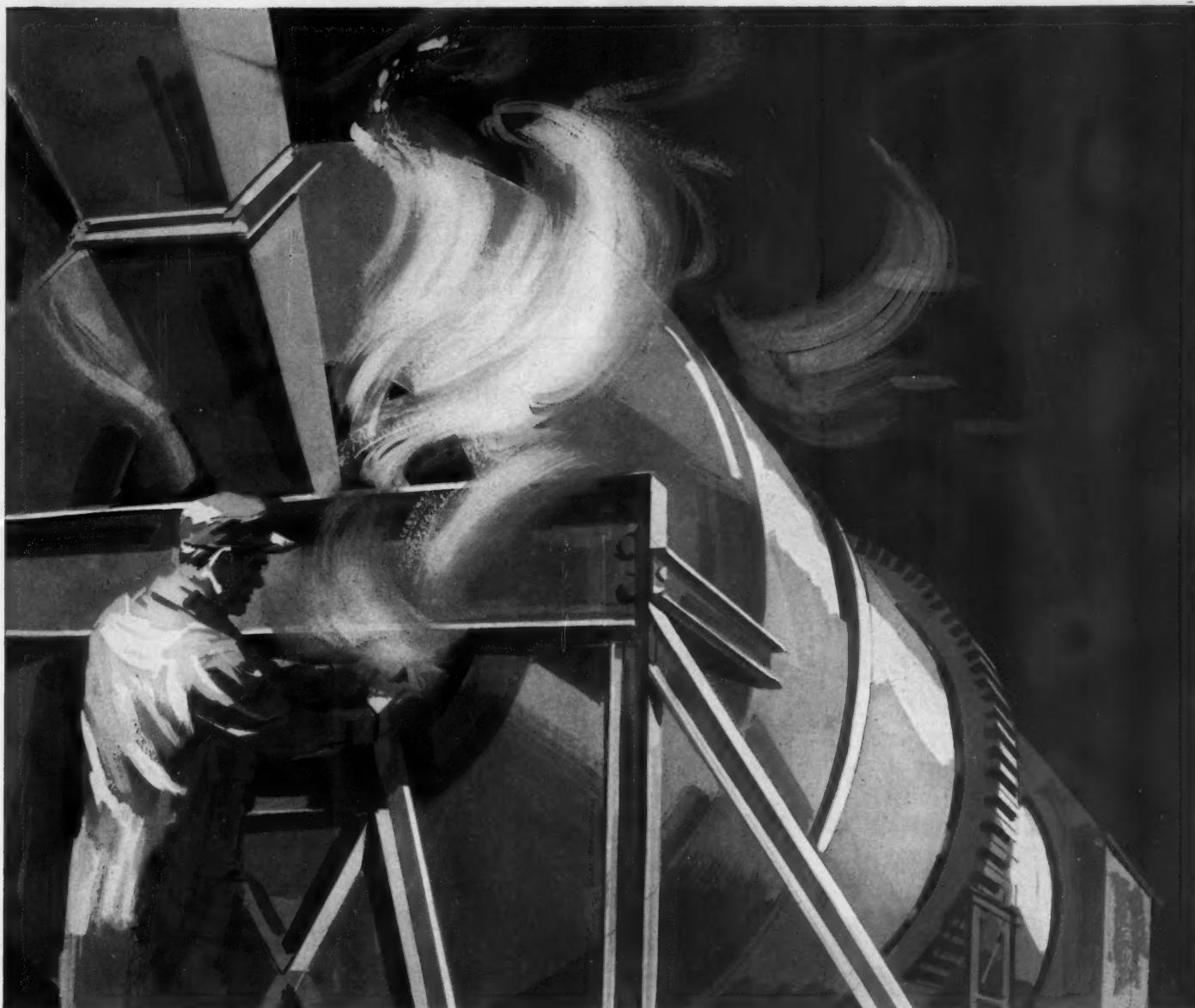
The Day Company offers an 8-page bulletin, which details, with diagram, the design and construction of its "RJ" dust filter. Installations are pictured and complete data is given for dimensions and specifications of



single and multiple units. For a free copy check No. 9451 on the coupon and mail.

No. 9392—Portable Fabric Tank

The Goodyear Tire & Rubber Co. has expanded its line of fabric containers to include a new portable tank for farm, construction and industrial use. The new tanks range in capacity from 60 to 350 gallons and when empty are said to be easily handled by one man. Made of nylon fabric impregnated with rubber, the tanks are resistant to liquid fer-



Texaco can help you stop loss of fertilizer raw materials

Many people in management believe that nitrogen loss in ammoniation, over-analysis, bag breakage, loading and unloading, amounts to only 4 or 5%.

Actually, only the best-run plants have such low losses. More typically, they may approach 15%.

These are findings by Texaco technical experts who help tighten procedures in fertilizer plants as part of the over-all Texaco "Stop Loss" program. For instance, nitrogen losses — including losses of ammonia, N₂ and oxides of nitrogen — are found to be a prime problem in making mixed fertilizer. Our people can advise on proper methods of mixing to avoid losses during ammoniation . . . on plant processes such as crushing, screening, drying, cooling. You can also tap our experts' knowledge of transportation and unloading equipment, storage and handling.

Would you like to have a Texaco man visit you for a look at your possible losses? The service is free. Write to Texaco Inc., Petrochemical Sales Division, 135 East 42nd Street, New York 17, N. Y., or 332 South Michigan Avenue, Chicago, Illinois. Dept. CR-40.

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PROPYLENE TETRAMER AND RUST INHIBITORS.

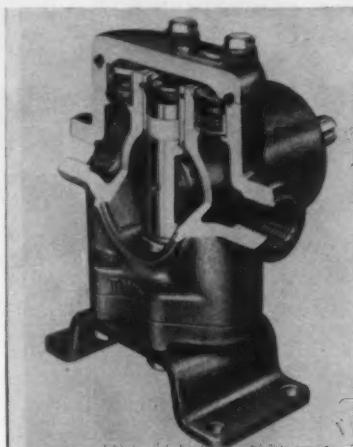
tilizer and herbicides, according to the manufacturer. Each tank is delivered with tie-down straps and fitted with a metal coupling for hose connections. For further information, check No. 9392 on the coupon and mail.

No. 9449—Phosphate Content Procedure

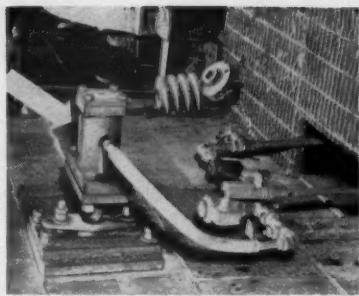
A two-page data sheet by Technicon Controls, Inc., outlines a newly developed procedure for continuous, automatic determination of phosphate content of phosphate rock. The reaction is based upon the reduction of phosphomolybdate to molybdenum blue by 1-amino-2-naphthol-4-sulfonic acid after the rock has been sample digested. An appropriate method for rock sample digestion is given. The data sheet includes a flow diagram of the system and actual chart recordings. To obtain free copy check No. 9449 on the coupon and mail.

No. 9442—New Piston Pump

A direct motor driven 2-cylinder piston pump, said to operate at pressures to 500 lb., has been announced



by Hypro Engineering, Inc. A special adapter fits the pump for PTO drive on tractors with high-speed shafts. The new pump is available in two sizes: Two and three gallons per minute at 1,800 r.p.m. Other manufacturer's specifications include ball bearing construction, cast iron body with stainless steel valves, treated cylinder sleeves, and leather piston cups. Typical uses include spraying insecticides and feed control chemicals. For complete information check No. 9442 on the coupon and mail.



No. 9446—Pneumatic Rappers

A new line of air rappers for electrostatic precipitators and dust collectors is being announced by National Air Vibrator Co. The rappers are made with a patented one-piece design said to reduce maintenance problems. Exhaust ports on both sides of the housing keep the vibrator piston centered. Vertical or

horizontal mounting can be made. The units measure 10½ in. long by 5 in. wide by 9¾ in. high, and weigh 52 lb. Air consumption at 50 p.s.i. is 9 c.f.m. For further information check No. 9446 on the coupon and mail.

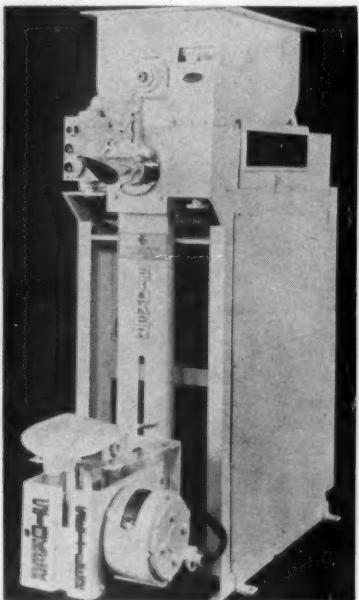
No. 9443—New Spreading Hood

A new, lightweight spreading hood by Henderson Manufacturing Co. is now available. It is described as having a spread of over 24 ft. when unfolded for application. It has nylon reinforced hood rubber curtains, and all sections are undercoated to prevent rust and corrosion. For further information check No. 9443 on the coupon and mail.

No. 9342—Bag Packer

The H. L. Stoker Co. announces a new bag packer which it claims provides new ease and better weighing accuracy. The new system is electronically governed and features interchangeable screw and feed systems, over-under indicator and a variety of accessories.

It will package powdered, granular, pelleted or flaked materials in valve or open-mouth bags and drums, according to company officials who point out that the new true-scale beam features a 100-to-1 scale lever-



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age which provides sensitivity of as little as ¼ oz. actuation of an electronic sensing capacitor.

For additional information including an illustrated, two-color brochure, check No. 9342 on the coupon and mail.

No. 9445—Air-Blast Mist Sprayer

Marlow Pumps has announced a new orchard and grove air-blast mist sprayer, called the “Econ-O-Mist.” The manufacturer says the new sprayer has been field tested for two years. It mounts on a three-point tractor hitch. Features include light weight and simplicity of design. For complete details check No. 9445 on the coupon and mail.

(Coupon located on page 14)

WHAT ARE DRI-SOL[®] BENEFITS IN MIXED-FERTILIZER PRODUCTION?

REDUCED SHIPPING COSTS

BETTER PROCESS CONTROL

LOWER FORMULATION COSTS

LOWER DRYING COSTS

A DRIER PRODUCT

INCREASED PLANT CAPACITY

FASTER CURING—QUICKER SHIPMENT

IMPROVED FERTILIZER QUALITY



More and more fertilizer manufacturers are turning to DRI-SOL ammoniating solutions as a sure, time-tested way to lower production costs and improve mixed-fertilizer quality.

For in addition to the eight cost-saving and quality-building advantages shown above, DRI-SOL can also help manufacturers offset the high water content of low-strength acid. It also helps to produce grades which are

difficult or impossible to make with conventional solutions.

What grade of DRI-SOL meets your needs best? From a wide choice of formulations you can select the solution that offers you the greatest number of advantages. Each grade contains less than 0.5% water. Grades range from 24% ammonia and 76% ammonium nitrate, to 50% ammonia and 50% ammonium

nitrate, and are generally available in all the Southern and Midwestern States.

Why not get complete information? Technical data to fertilizer manufacturers available upon request. Write: Agricultural Chemicals Department, Commercial Solvents Corporation, 260 Madison Avenue, New York 16, New York. Offices also located in: Atlanta, Shreveport, St. Louis.

COMMERCIAL SOLVENTS CORPORATION



QUESTIONS from you

ANSWERS from experts

QUESTION: "Fine dust from a dry granular material comes out of the feed hoppers or the legs as the front end loaders dump material into them. Will a cyclone dust collector reclaim these fine dust particles or will we need a scrubber system to control this situation?"

—C. D. Perkins, C. D. Perkins Co., Dekatur, Ill.

ANSWER (By Engineers at The Day Co., Minneapolis, Minn.) This is a two-part question, so we will answer one portion at a time. Let us therefore discuss the problem, "Fine dust from a dry granular material comes out of the feed hoppers or the legs as the front end loaders dump material into them."

When a given number of cubic feet of material is dumped into an empty container, whether it be a leg, hopper, bin, etc., an equivalent number of cubic feet of air is displaced which is forced out of the container into the plant. This displaced air carries with it fine float dust created when the dry granular material is dumped. This, therefore, calls for standard dust control practice. The velocity of the escaping dusty air must be overcome by air currents created by a dust control fan and sufficient air must be handled to at least compensate for the displaced air.

There should be an effective dust hood installed where the end loader dumps the material. The more effective the hood design the less air will be required to prevent the dust es-

caping into the plant atmosphere. The same principle applies to the feed hoppers.

The dust control of elevator legs is somewhat different. In this type of equipment you have fanning action of the empty elevator buckets as they travel in a downward direction. As they are filled with product, additional air is displaced and this displaced air must also be controlled. The most effective point for dust control on an elevator leg is to put proper suction on the boot.

These suction connections must then connect to a suction fan and then to a dust collector of a type which will do an efficient job of separating the fine dust particles from the air stream as will be discussed in the second part of this question.

The second part of the question is, "Will a cyclone dust collector reclaim these fine dust particles or will we need a scrubber system to control this situation?"

When the questioner mentions a "scrubber system," we assume he means a wet scrubber and are an-

swering the question under this assumption.

It is difficult to predict the efficiency of a cyclone without knowing the size of the dust particles being handled. Generally speaking, a cyclone-type dust separator will do a reasonably good job with particles down to 20 microns, but below this, the efficiency of a cyclone separator falls off rapidly.

It is our opinion that the fine float dust which will be picked up in this operation should be separated from the air stream with a filter, rather than put through a cyclone-type dust collector. An automatic self-cleaning type filter is virtually 100% efficient. The cleaned air can, in many cases, be returned to the work area. The dust collected can be returned to the product stream, thus eliminating shrinkage of product.

In no case would we recommend a wet scrubber to control the dust on this type of installation. If a wet scrubber is used, many additional problems are created. In the first place, when the dust mixes with water, a slurry is formed which must be disposed of, or dried, unless it can be returned to the process in wet form. If disposed of, some product shrinkage occurs. If dried and returned to product stream, additional cost factors must be considered. Scrubbers must be protected against freezing, which in some cases presents a problem.

Fine dust created when dumping front end loaders can be prevented from escaping into the plant and the fine dust can be reclaimed. However, it requires good dust control equipment properly applied. Such equipment and engineering service is available from any one of several reputable dust control companies.

A new easy opening device to provide full-top or pour-spout opening of sewn open mouth and sewn valve multiwall bags has been introduced by the Bag Division of St. Regis Paper Co. Called "Grip-N-Rip," it is designed for bags used for agricultural and chemical products.

The new feature employs a triple-strength filter tape in place of stand-

ard filter cord, the makers say. The filter tape, sewn over the regular bag top tape, provides a pulling tab for easy opening.

For full bag top opening, the filter tape is pulled away from the top of the bag. The regular bag top tape, held in place by the same thread, is then free, and the bag is completely open, St. Regis says.



EASY-OPENING MULTIWALL—St. Regis Paper Co. has introduced a new easy-opening device for sewn open mouth and sewn valve multiwall paper bags. Illustration shows simplicity with which makers say the bag may be opened.

\$10 Million Expansion

Planned by International

For Canadian Potash Mine

Plans for a \$10 million expansion of production facilities at the potash mine project of its Canadian subsidiary were announced recently by International Minerals & Chemical Corp.

Company officials said the expansion, which would boost output potential from 420,000 tons to 1,200,000 tons of potash product annually, is being planned to meet expected sales demand. The expenditures would bring total plant investment close to \$40 million upon completion, the company said.

Initial production from the shaft at Esterhazy, Saskatchewan, is expected by early summer of 1962 and refining facilities already completed will handle 420,000 tons of product annually. Engineering and design on the additional facilities were to get under way immediately, the company said. Operation at the 1.2 million-ton rate would begin in January of 1963.

IMC has potash operations at Carlsbad, New Mexico. The company said that its output there in the last few years has failed to meet market demand despite new production records.

Spencer Acquires Third Packaging Supply Company

Spencer Chemical Co. has announced its recent acquisition of all the outstanding stock of Wrapture, Inc., Flushing, N.Y., a supplier of flexible packaging material. Terms of the agreement were not disclosed.

J. C. Denton, Spencer president, said that Wrapture will become a wholly-owned subsidiary of Spencer and that its president, Samuel Rivman, will continue to manage the firm's business. The acquisition of Wrapture brings to three the number of companies acquired by Spencer in the flexible packaging field. Previously announced (CropLife, August issue, page 9) were the acquisitions of Crystal Tube Corp. of Chicago and Flexicraft Industries, Inc. of New York City to become wholly-owned subsidiaries of Spencer.

Mr. Denton said that Spencer has no plans to produce plastic films, but that the firsthand experience it will gain through these three companies should be valuable in designing new plastic resins for packaging end-uses.

Pesticide Industry in California on Increase

Statistics on pesticides recently released by the Bureau of Chemistry of the California State Department of Agriculture indicate substantial increases from 1955 to 1960 in the growth of the state's pesticide industry.

For example, the number of registered firms increased from 798 to 887 for general firms and from 195 to 232 for limited firms.

Also shown in the 192-page report is the increase in number of products registered from 11,904 to 14,867 for the same 5-year period.

The report also breaks down figures on number of samples thusly: Analyzed—an increase from 1,859 to 1,992; Deficient—from 182 to 234, and Misbranded—decreased from 79 to 56.

Presented in the book also is a summary of economic poisons examined during the fiscal year ended June 30, 1960. Most categories showed a low number of samples listed as "deficient."

Out of a total of 1,992 samples examined, 234 were declared deficient, 56 were listed as misbranded, and 70 samples were not registered properly.

New Division Formed

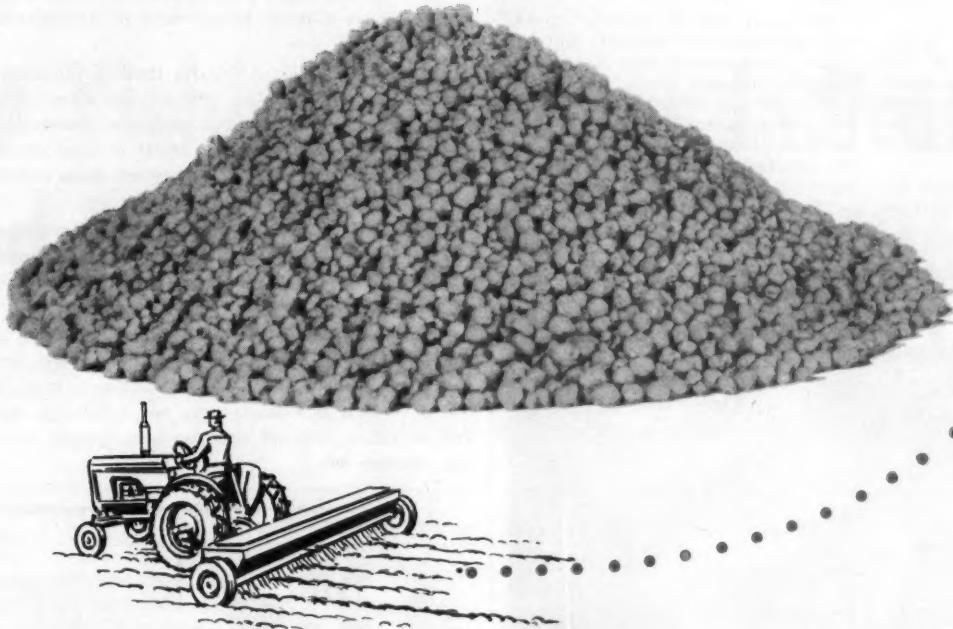
B-I-F Industries, maker of equipment and engineered systems for many process industries, has announced it has become a division of The New York Air Brake Co. B-I-F Industries will continue in Providence, R.I., under the same operating management and with no change in aims or objectives.



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Agronomic Briefs

From the Experiment Stations

THAT small particles are better than big ones for granulated insecticides aimed at corn rootworms, is the claim made by University of Wisconsin researchers.

Entomologist J. W. Apple applied several different sizes of granules and got the best results with the smaller sizes, reports indicate. The granules were applied from hoppers on a corn planter at planting time.

Dr. Apple points out that the first granulated insecticides used, back in 1953, consisted of small granules designated as 30/60 mesh. One big objection was the fineness of the granules—the material was dusty and tended to blow around much like a powder. So the granules were made larger.

In 1960 a much larger 15/30 mesh size became standard. These particles run about one million per pound as compared to around 12 million 30/60 mesh granules per pound.

Dr. Apple's tests indicate that the 15/30 mesh size is satisfactory under most conditions, but that results with smaller particles may be a little better. The largest particles he tested were 8/15 mesh, which gave poor results.

Based on this research, Dr. Apple has suggested 20/40 mesh as the standard mesh size for granulated rootworm insecticides—larger than the 30/60 mesh particles, but a bit smaller than last year's standard size.

He used aldrin and heptachlor insecticides in these tests, applied in

a three-quarters inch band about an inch above the seed. To emphasize differences due to granule size, heptachlor was used at one-fourth pound per acre—half the recommended dosage.

He also tested various concentrations of insecticide on the granules. This was to answer the question of whether it is better to have each granule carry a lot of insecticide, or to use more granules, each carrying a smaller amount.

The tests show that the lowest concentration—5%—gave the best rootworm control. The kind of clay used for making the particles didn't make much difference in rootworm control.

Several changes in soil testing procedure are being put into effect by the University of Georgia College of Agriculture.

Directors W. A. Sutton of the cooperative extension service and George H. King of the experiment stations announced the changes recently.

Extension service county agents will now make soil test lime and fertilizer recommendations in most counties. In some cases, teachers of vocational agriculture also will make such recommendations. Previously, recommendations had been made by the soil testing labs which will continue to do actual testing work.

"This change is designed to meet

the fertility needs of individual farms," Mr. Sutton pointed out, "and it is believed that the change will result in improved lime and fertilizer recommendations."

County agents, he declared, have been thoroughly prepared to handle this responsibility. All have attended training meetings conducted by the teaching, research and extension staffs of the college of agriculture to learn the basic principles of lime and fertilizer recommendations based on soil analysis.

Another change, Mr. Sutton continues, is a new information form for use with soil samples submitted to testing laboratories. The new form, he said, will result in more rapid and efficient handling of soil samples.

Oregon fertilizer mixers are preparing an extensive program with their products to stimulate the use of fall fertilization, with special emphasis being placed on legume and legume grass mixtures as recommended by the experiment station and ex-

tension service of Oregon State University.

Work by the experiment station has shown fall applications to be particularly suited on these crops in western Oregon. Fall fertilized legumes and grasses are said to be more winter hardy. The fall program of full feeding helps in maintaining stands of these forage crops as well as increasing total yields. Earlier growth on pastures in the spring will be another benefit of such a program, they point out.

Mixers in Oregon are preparing fertilizers of an 0-1-1 ratio to apply 60 lb. P₂O₅, 60 lb. K₂O, 30 lb. sulfur and two pounds actual boron an acre. Recommended for soils low in potash is the 0-1-2 ration to supply 60 lb. P₂O₅, 120 lb. K₂O, 30 lb. sulfur and two pounds of boron.

Area dealers are working with farmers in taking soil samples to determine more accurately the fertility needs of particular fields. Where soil tests are not available, materials 0-1-1 ration (the 0-60-30-2) maintenance treatments are recommended.

BENEFICIAL BUNNIES



The rabbit, long a pest to Canadian agriculture, is now being used beneficially by the Canada Department of Agriculture to identify virus diseases of fruit trees.

Dr. J. H. Tremaine reports that at Vineland Station, Ontario, live rabbits are injected with the virus of sour cherry disease to produce the serum. The virus does not give the rabbits a disease, nor does it harm them, but it produces antibodies in the blood in four weeks. When a similar virus is added to the serum, the clear solution turns cloudy; when an unrelated virus is added, it remains clear.

The test is used to determine the relationship between sour cherry viruses and those of peach, plum, prune and apple diseases that occur in the Niagara Peninsula and to compare Canadian sour cherry viruses with those of other countries.

The use of antibodies in such tests allows a comparison of viruses without importing potentially dangerous foreign viruses into Canada. Where viruses from other countries are similar to those in Canada, methods of control developed in Canada may be of value in those countries. Steps might also be taken to avoid bringing into Canada foreign viruses that are different, officials say.

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- ★ Light weight

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GALLON
TANKS**

23" diameter
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Now—a smaller model of the popular 200-gallon tank made of Molded Fiber Glass—the tough, long-lasting material so much less expensive than stainless steel, yet stronger than steel, pound-for-pound!

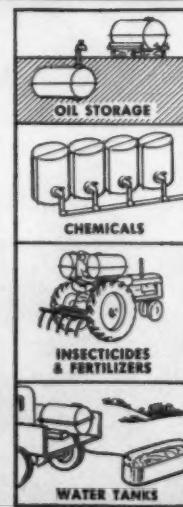
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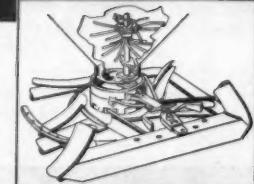


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Arcadian® News

Volume 6

Nitrogen Division, Allied Chemical Corporation

Number 9

Crop Yields and Prices Indicate Good Fertilizer Market for 1962

High crop yields along with increased government payments to farmers for reduced acreages of cash crops are promising indications of a good fertilizer year in 1962.

According to the latest crop report, the corn acreage in 1961 was down 18%, but the acreage planted to corn averaged 57.5 bushels per acre. This record-breaking average means a big drain on plant food. Based on known plant food requirements, the 1961 crop of corn (*grain, not including stover or silage*) removed from the soil 1,508,549 tons of nitrogen, 586,489 tons of phosphoric acid and 418,872 tons of potash.

Much of the acreage planted to corn did not get good fertilization, due to the late, wet spring season and the delayed announcement of the feed grain program. This means that many farmers who failed to use enough fertilizer in 1961 will be better prospects in 1962.

Fertilizer Can Boom

Looking ahead to a continued government feed grain program next year, fertilization of the corn acreage actually planted should boom for several reasons. More of the acreage will be concentrated on good land owned by farmers who fertilize as a matter of practice. Livestock men who feed their corn are faced by higher cash grain costs, and will be anxious to use enough fertilizer to grow

ESTIMATED PLANT FOOD REMOVAL BY MAJOR CROPS IN 1961 (Based on latest forecast production figures, August 1, 1961)

	Tons of N	Tons of P ₂ O ₅	Tons of K ₂ O
CORN (3,352,037,000 bu.)	1,508,459	586,489	418,872
COTTON (13,918,000 bales)	278,522	139,261	92,818
WHEAT (1,204,096,000 bu.)	752,501	376,245	225,745

Plant food removed is calculated: on CORN for grain alone not including stover; on COTTON for lint and seed, not including stalks, leaves and burrs; on WHEAT for grain, not including straw.

more feed for themselves. And government payments on acreage reduction will bring farmers ready cash earlier in the fertilizer buying season. The traditional response of farmers to acreage reduction programs can be expected to work even stronger in 1962—to cause more fertilizer to be used on better-tended acres.

With the cotton crop estimated at 13,918,000 bales, as compared to last year's 14.3 million bales, but well above the 10-year average, another large-acreage crop has removed 278,522 tons of nitrogen from the soil, along with 139,261 tons of phosphoric acid and 92,818 tons of potash. More of this land is in the cotton area stretching from the Carolinas to Texas this year, since acreage was reduced mainly in the new cotton areas of

California, Arizona and New Mexico. With cotton markets good and stored cotton supplies down, the cotton acreage for next year can hold up well—and the market for cotton fertilizer should be strong.

Less Land—More Fertilizer

Wheat growers are now voting on the 1962 marketing proposal to cut wheat acreage 10% and to increase the support price from the present \$1.79 to \$2.00 a bushel. More fertilizer on fewer acres again! Sorghum and other feed grains will also be on a reduced acreage basis next year. But soybeans, sugar beets and certain other crops can be expected to call for more fertilizer tonnage and greater acreage in 1962.

(Continued on following page)

Arcadian News for Fertilizer Manufacturers from Nitrogen Division, Allied Chemical

(Continued from preceding page)

The trend of the times, with or without government farm programs, is toward more efficient farming. This calls for greater output with less labor. More farmers each year are finding that it pays to use more fertilizer per acre, whether they farm fewer acres or more acres. And in spite of any one year's government programs, as the number of farms goes down, the survivors are farmers who use more fertilizer.

For example, look at our total production of all crops. At its peak in 1960, farm production was up to 122% of the 1944-49 average. Yet this all-time high production came from 320,823,000 harvested acres, compared to 350,000,000 acres we harvested just after World War II. This trend is possible only as we use more fertilizer to keep each acre producing more. As we look ahead to 1962, fertilizer is going to be even more important to prosperous farming.

Farm income is good this year, and land and labor costs will stay high or go higher, while the cost of fertilizer stays relatively low for its value. Government programs are limiting acreage of more crops, and are pumping extra money into agriculture. County agents, vocational agriculture teachers and other agricultural experts are preaching the gospel of more efficient farming on every acre left in production. All these trends favor heavier use of fertilizer in 1962.

Make premium grades

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It will pay you to use DURANA Nitrogen Solution to produce tobacco fertilizers, specialty fertilizers or other premium-grade fertilizers containing nitrate nitrogen, ammonia nitrogen and water-insoluble organic nitrogen.

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DURANA also helps give fertilizers excellent mechanical condition and facilitates the production of granular-type fertilizers. For more information about DURANA, contact Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

TIPS ON DRYING

Drying granular material is similar to drying a bathing suit. You must persuade the water molecules to leave — permanently. A wet bathing suit in an off-ocean breeze and hot sun dries slowly, but a dry land breeze will remove moisture quite rapidly.

With wet granular material, part of the water is on or near the surface and part is trapped inside each granule. What happens if you heat the granules without much air circulation? The surface water evaporates until the surrounding air is nearly saturated, and then the water vapor in the air returns to the granules as fast as the remaining water departs. To break this stand-off we need a dry breeze, and we get it by putting more air over the material.

Stop a minute and consider that this surface water problem is distinct and separate from the problem of moisture trapped inside the granules. Removal of surface water requires relatively large quantities of air and moderate granule temperatures. Because evaporation of surface water tends to keep granules cool, it usually is not necessary to worry about overheating the material.

With counter-current drying, there often is so little air that some of the moisture picked up from warm material near the discharge of the drier may be deposited on cooler material farther back in the drier. Remember that every pound of water evaporated absorbs more than 1,000 B.T.U.'s. (This will cool 40 pounds of air about 100°F.) 1,000 cubic feet of saturated air at atmospheric pressure and 60°F. weighs about 75 pounds.

Once the surface water is gone from granular material through plenty of air circulation, we must free trapped moisture from inside the granules. How do we get this moisture through the surface? We start the water particles moving around by heating the granules. The particles try to migrate to the surface. Here we often have difficulty because many granular materials form a hard, nearly impervious coat when their sur-

face is dried quickly. When this coat is not formed, drying proceeds without any special problems.

If a surface coat is formed, then more time and higher temperatures are needed to allow trapped moisture to escape. Or, a special technique is required.

In drying clay materials, formation of a hard coat is prevented by keeping enough moisture in the air to avoid hardening of the surface. At the same time, clay temperature must be raised so that moisture working its way to the surface can escape faster than moisture in the air can enter.

Design of modern driers includes equipment to regulate retention time, air quantity and velocity, inlet and exit air temperatures, inlet and exit moisture content of the material and of the air. Although operating conditions are quite flexible, there are limits to the performance that can be expected from any drier. For example, retention time can be increased by reducing revolutions per minute, but the material at the lower speed may not "shower" enough to make good contact with the heating air. An increase in air quantity above recommended levels may dry the material — and carry most of it out of the drier!

In this article, we have assumed that heat is being carried by the drying air and not by direct radiation. Driers that allow the material to "see" the source of heat may create enough radiant energy to overheat the granules. In such cases the drier manufacturer should be consulted to learn if a barrier of some type, such as a combustion chamber, can be interposed.

In general, remember to follow two rules: (1) be *sure* to have enough air in your drier to carry away surface water, and (2) allow enough time for trapped water in the granules to escape.

New U.S.D.A. Yearbook

You'll want the valuable new reference book for agricultural dealers and farmers, the new 1961 Yearbook of the U.S. Department of Agriculture, entitled "Seeds." In 591 pages packed with useful information, this volume covers the production, processing, certification, testing and marketing of all kinds of seed crops, including field crops, vegetables, flowers, forest trees and lawn grasses.

NOTE: The information furnished in this issue of the *ARCADIAN News* is obtained from studies and tests considered reliable; results, however, are not guaranteed.

Fertilizer Helps Farmers Grow Big Crops of Fish

TONNAGE OPPORTUNITIES

Over half of our 21 million fishermen live in the country. As fishing in streams and lakes gets more crowded, farm ponds are growing in popularity for "sure-catch" fishing. Fertilizing ponds makes it easy to increase the yield of fish, and also helps keep out undesirable water weeds, which improves the value of ponds for fire control and water supply.

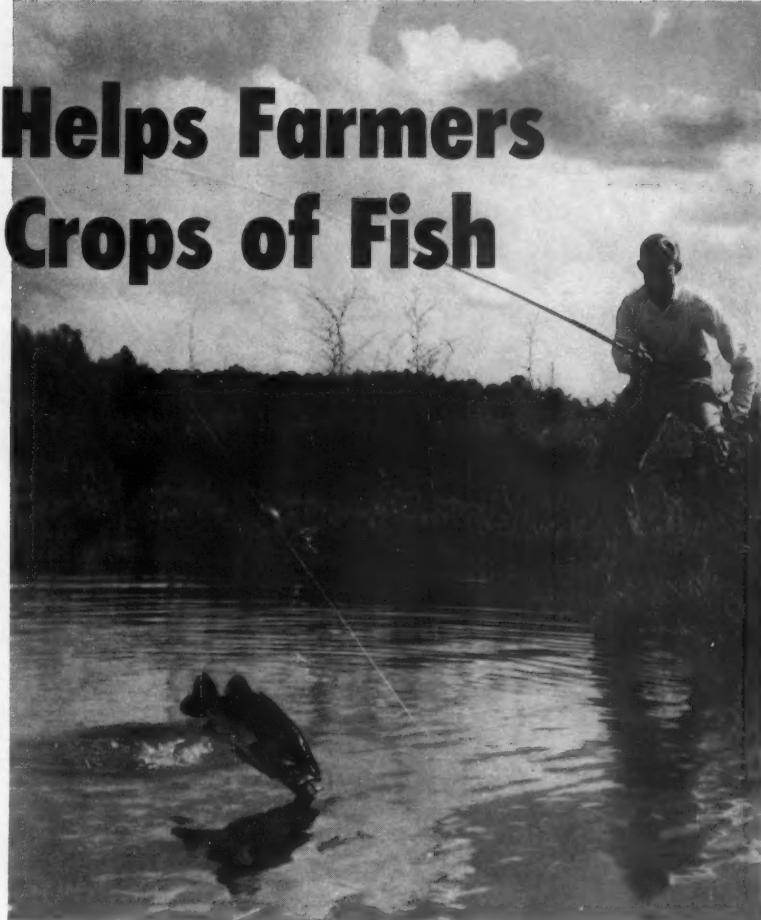
Farm ponds are being dug at a rapid rate with more than a million in the country now. Additional ponds are used for raising bait minnows. And in rice-growing areas, some land alternates between a crop of fish and a crop of rice. This all adds up to a huge fertilizer market.

More Fish Grow Faster

For good fishing, every acre of pond water needs 100 pounds of mixed fertilizer, 6 to 12 times a season, starting in early spring and ending in fall when the water gets cold. Some pond owners use fertilizer in winter to kill pond weeds. In Florida, ponds can be fertilized, and fished, every month of the year.

High fertility in pond water increases fish production by a chain reaction. The nitrogen, phosphate and potash supplied by commercial fertilizer grow vast numbers of microscopic plants. Insects and other tiny animals feed on these plants. In turn, they are eaten by small fish which are then gobbled up by bigger fish. It takes 4 to 5 pounds of insects for each pound of bluegills or bream. And 4 or 5 pounds of these small fish produces a pound of bass.

Bluegills and large-mouth bass are the recommended combination for stocking warm water ponds in which the surface temperature reaches 85°F. or more in summer. Rainbow and brook trout do well in spring-fed or other cold water



ponds where the summer temperature seldom reaches 75°F. Other fish are sometimes used but the bass-bluegill combination provides the most fishing.

Fertilize in February

Nitrogen and phosphorus are the most important elements in a fish pond fertilizer. If the water is acid, lime should be spread. And 2-2-1 or 1-1-1 ratio fertilizer gives good results. Many of the experts suggest an 8-8-4 or 8-8-2 analysis. Spreading should start by early February in the Gulf States and Carolinas, and in early March farther north. Fertilizer added every 10 days soon produces billions of tiny plants which turn the water a brownish or greenish color.

Fertilizer is then added every month or so. An easy rule is to add fertilizer when you can see your hand clearly as you dip one arm to elbow depth in the pond. A more accurate measure is to nail a white disk on the end of a broom handle. Mark the stick at 12 inches and 18 inches above the disk. The pond is fertile enough when the disk goes out of

sight at 12 inches deep in water. It's time to fertilize when you can still see the disk at 18 inches deep.

Deep pond edges and well-fertilized water keep most water weeds out of ponds. This reduces the mosquito nuisance and helps bass catch the small bluegills which might overpopulate a weedy pond. Pond weeds also use up oxygen which the fish need.

Commercial Fertilizer Best

Commercial fertilizer is best for fish ponds. Organic fertilizers favor large weeds and undesirable algae. Spreading the fertilizer is simple. It doesn't have to be spread in deep water, just scattered in shallow water along the pond edges. Wind and water currents mix it thoroughly.

For full information on fertilizing fish ponds, see your county agent, your soil conservation district agent or game warden. And write to the U. S. Department of Agriculture for Farmers' Bulletin 2094, "Managing Farm Fishponds for Bass and Bluegills."



Arcadian NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %					Neutralizing Ammonia Per Unit of Total N (lbs.)	PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water		Approx. Sp. Grav. at 60° F	Approx. Vap. Press. at 194° F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	-7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA®									
DURANA contains 8% formaldehyde.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

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OSCAR & PAT

EDITOR'S NOTE: For years Crop-life readers were entertained by Oscar and Pat during the latters' career as proprietors of a retail store selling fertilizers and pesticides to farmers. The pair now have bought a manufacturing plant at Pat's instigation and, beginning with this episode, get into "big time" activities.

Al P. Nelson, originator of Oscar and Pat, will continue to chronicle their exploits through this new series.

By Al. P. Nelson

"Andt I'm tellink you we could go broke!" Oscar burst forth, his face flushed with the intensity of his feeling. "Fourteen employees, when we used to have five. Two bik bulk delivery and spreader trucks, a great bik building with lots of machinery, so much depreciation. Ach, the money I haf to get in every week to pay all those men. And that crazy Pat. He is twice as full of promotion ideas as he was before."

"You have to be promotion minded in a big business like this," Tillie reminded him. "That's the best way to reach more potential customers."

"Ach, you talk like that Irisher," Oscar said disgustedly. "To move to this county seat, Minnie and I had to sell our nice home back in Springdale. The bungalow we bought cost much, much more than we got for our old home. And this fertilizer plant, ach, the money we still got to pay off. That old man we bought it from—he is chust waitink to take it ofer again when we go bankrupt."

Tillie Mason looked stern for a moment. "Well, if that's the way you feel about it, why did you sell the retail store in Springdale and come here with Pat?"

A look of misery came over Oscar's florid face. "I had to come," he said. "Pat wanted to sell me the store at Springdale, but I didn't want to buy it. I had my hands full there chust keepink account of the books. How could I find time to sell to all those farmers that want fertilizer on credit? I am too young to retire, Tillie. I hadt to come here with Pat."

Tillie chuckled "Oh, you two fight like cats and dogs," she smiled, "but neither of you will admit you need the other. You hold Pat down and don't let him overspend, and he keeps you from being too tight."

"If I hadn't been tight," Oscar growled, "the retail store at Springdale wouldt not haf been a money maker. We soldt at a goodt price." He picked up a sheet of new stationery, printed in green ink. "Ach, Fertile Fertilizer Co." Such a fancy name. Tillie, don't use too much of this stationery. If you make a bik mistake typing addresses use stickers to cover over. Ach, we half to safe money chust like we didt in the retail store at Springdale. Money is always in style, you know."

The door opened and in stepped tall, hatless Pat McGillicuddy. Under his arm he had a big advertising mat book which he had picked up at the newspaper office.

"Hi," grinned Pat cheerfully. "Boy, it's hot outside!" He took his handkerchief from his hip pocket and wiped his sweat-beaded face. "What we ought to have in this office is air conditioning."

"Air Conditioning!" Oscar repeated, "Ach, spendink money again before we take some in. That little fan in the corner is enough. Let's sweat a little, Irisher. That's what I do when I look andt see how much money we got to take in to meet the payroll. Fourteen men."

"So, you are at it again, eh, Oscar." Pat went into his office and laid the mat book on the desk. "We're in the big time now, compared to that retail store setup, Oscar. And our thinking has to be big time, too."

"Big time or little time, you still haft to spend less than you take in," Oscar snapped. "That's the way to make money."

"Okay," conceded Pat, opening the mat book and eagerly thumbing through the illustrated pages. "But when you buy a new business like we did, you have to expand a little, renovate, advertise a little more. That takes money. Maybe you won't break even the first few months. So what? Things will change."

"So what?" echoed Oscar bitterly. "If we spendt more than we take in, we get off on the wrong foot, and then it is hardt to change."

Pat looked up patiently. "Oscar, just give us a little time. We'll come out all right. Gosh, this is a great business." He looked out the window as a big semi-trailer rolled out of the plant area, loaded with bagged fertilizer. "Another load of Fertile Fertilizer for our dealers, Oscar," he said enthusiastically. "Just think of it! In the retail store we used to sell fertilizer by the bag. Now we make our own and sell it in truck load lots."

"But is it paidt for?" Oscar asked coldly.

"Of course not. You have to give dealers some credit and they have to extend credit to their customers."

Oscar looked stern. "But we haf to pay for the materials, the labor to produce it, the depreciation and repairs on the machinery and the trucks, the salaries of fourteen men, withholding and social security payments, stationery, light, power, phone—"

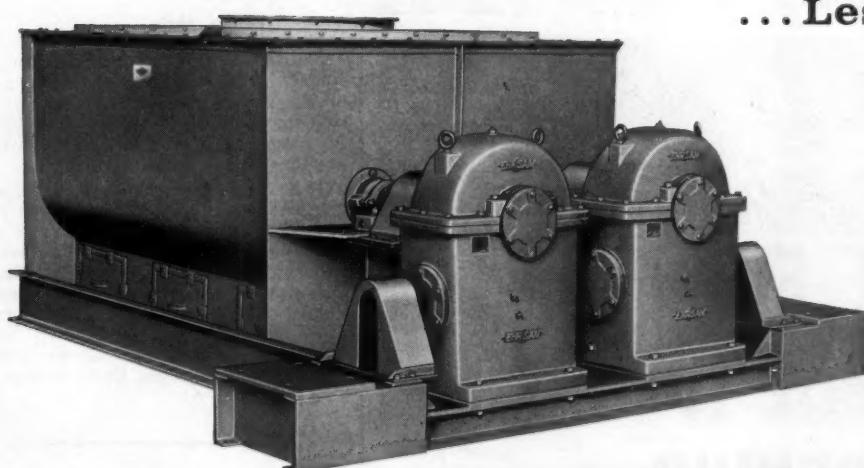
"Stop!" Pat's face was white. "Oscar, I thought it would be different here—with greater opportunities. I thought you'd have a more open mind, that you would change—just a little."

Oscar shook his head. "Change? Why shoult I? When I know I am right and you are wrong? McGillicuddy, let me tell you this—effery time you want to spendt a dollar, I am goink to be right here to try to cut that dollar down to 50 cents,

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or even 25¢ or maybe to less than a cent."

"You wouldn't!"

"I wouldt. You sales fellows that are always hollering about more sales should take a lesson in business management. There is no use doink a great big business effery year andt find out you made very little profit, because you didn't control expenses. I don't belief in working for nottink, do you?"

"No, I don't, but—"

"Well, start thinkin' aboudt it. Haf your wife sew up that hole in your pocket—mit leather."

Oscar stomped self-righteously back to his own office, a frosted glass affair with stained oak panels.

Pat walked to the window and looked out into the yard where a fertilizer spreader was laying down big piles of fertilizer. "How can I stand it?" he muttered. "How can I stand it?"

A moment later he shrugged and then sat down at his desk and began laying out a half page newspaper ad, his pencil fairly flying over the paper.

California Fertilizer Assn. Plans November Meeting

Program for the 38th annual convention of the California Fertilizer Assn. is nearing completion, according to James F. Sloan, CFA president. Scheduled to be held at the Jack Tar Hotel, San Francisco, Nov. 12-14, the convention is expected to attract 500 or more industry leaders from all sections of the U.S., as well as from Canada and Mexico.

Featured speakers will include Ralph Everett, director of Empire Sales Training, Inc., Miami, Fla., and Stary Gange, Visalia, Cal. Mr. Everett is an authority on salesmanship, and Mr. Gange is an eloquent exponent of the American enterprise system.

The ladies will be guests of the association at a luncheon, where they will be entertained by Paul Speegle, humorous columnist and commentator for the San Francisco "News-Call Bulletin."

Four CFA directors will be elected

to serve for three years, and the 1962 officers will be chosen by the new 12-man board.

Recreation will consist of men's and women's golf tournaments, a mixed bowling tournament, and bridge and canasta competition. Prizes will be awarded winners in these events.

The convention will come to a close following the annual banquet on the evening of Nov. 14.

Persons expecting to attend the meeting should contact the CFA office at 719 K Street, Sacramento 14, Cal., for complete information, advance registration form, and printed program, Mr. Sloan says.

Products Increase

The Canada Department of Agriculture in Ottawa reports that it registered 684 fertilizer products from 110 companies during the 1960-61 registration year, as compared to 652 products made by 103 registrants during the previous year.

Committees Named for Southwest Conference

Committees for the 1962 Southwest Fertilizer Conference and Grade hearing have been announced. The conference, scheduled for July 18-21, at the Galvez Hotel, Galveston, Texas, will be under the direction of two chairmen: Dr. N. D. Morgan, American Potash Institute, Shreveport, La., for the industry committee, and Henry DeSalvo, Little Rock, Ark., head of the control officials and technical committee.

The industry committee, comprising husband-and-wife teams, was named as follows: N. D. Morgan, chairman—program and arrangements; Dr. Ivan Miles, Olin Matheson Chemical Corp.; Tom Wright, Texas Farm Products, Nacogdoches, Texas; Harold Trammell, Farmers Fertilizer Co., Texarkana, Ark.; Dave Seay, Phillips Petroleum, Houston, Texas; Kay Chandler, Best Fertilizer, Houston, Texas; Doug Kelley, Monsanto Chemical Co., Eldorado, Ark.; Rex Morgan, Ark-Mo Plant Food Co., Corning, Ark.; Floyd Prather, Central Texas Fertilizer Co., Comanche, Texas; Arnold Newman, Caprock Fertilizer Co., Littlefield, Texas; Grady Goodpasture, Goodpasture Grain & Milling Co., Brownfield, Texas; Voris King, Kelly, Weber & Co., Inc., Lake Charles, La.; Lloyd Dohnau, Arkansas Plant Food Co., Little Rock, Ark.; Floyd Williamson, Sr., Louisiana Agricultural Supply Co., Baton Rouge; Stanley Hackett, Shreveport, La.; Jack Lindsey, publicity, IMC, Shreveport, La., and Jimmie Powledge, secretary-treasurer, National Hotels, Galveston, Texas.

The control officials and technical committee, in addition to Mr. DeSalvo, chairman, comprises the following: Park Yates, Oklahoma State Department of Agriculture; Reed McDonald, Texas; R. W. Ludwick, New Mexico; Dr. M. B. Sturgis, Louisiana, LSU; Dr. Walter Peevy, Louisiana, LSU; Dr. Lloyd Jones, Louisiana, LSU; Dr. Dale Hinckle, Arkansas University; Woody Miley, Arkansas University; Earl Allen, Arkansas University; Dr. Marlowe Thorne, Oklahoma State University; Dr. Gaylord Hanes, Oklahoma State University; Dr. Bill Trogdon, Texas A&M; Dr. W. F. Bennett, Texas A&M; Blueford Hancock, Texas A&M, and Dr. E. A. Epps, Louisiana State Department of Agriculture.

Scholarship Winner

Charles W. Bird, Oroville, Cal., student at Chico State College, has been awarded a \$100 cash scholarship for the 1961-62 term by the Soil Improvement Committee, California Fertilizer Assn.

This is one of six scholarships awarded each year by the committee. Recipients of the other awards have not yet been chosen by their college faculty awards committees. Other colleges concerned with these annual awards include California State Polytechnic College, two on each campus (San Luis Obispo and Pomona), and Fresno State College, Fresno.

CUTWORMS EXPECTED

Entomologists in western Canada are predicting a major battle against pale western cutworms and grasshoppers in 1962. While they have not yet mapped out the areas of serious and moderate infestations they indicate that these pests, because of weather conditions, have had an opportunity to infest a larger acreage over the Canadian prairies than for several years. Under favorable conditions, the entomologists warn, the cutworm outbreak next year could be the worst on record.

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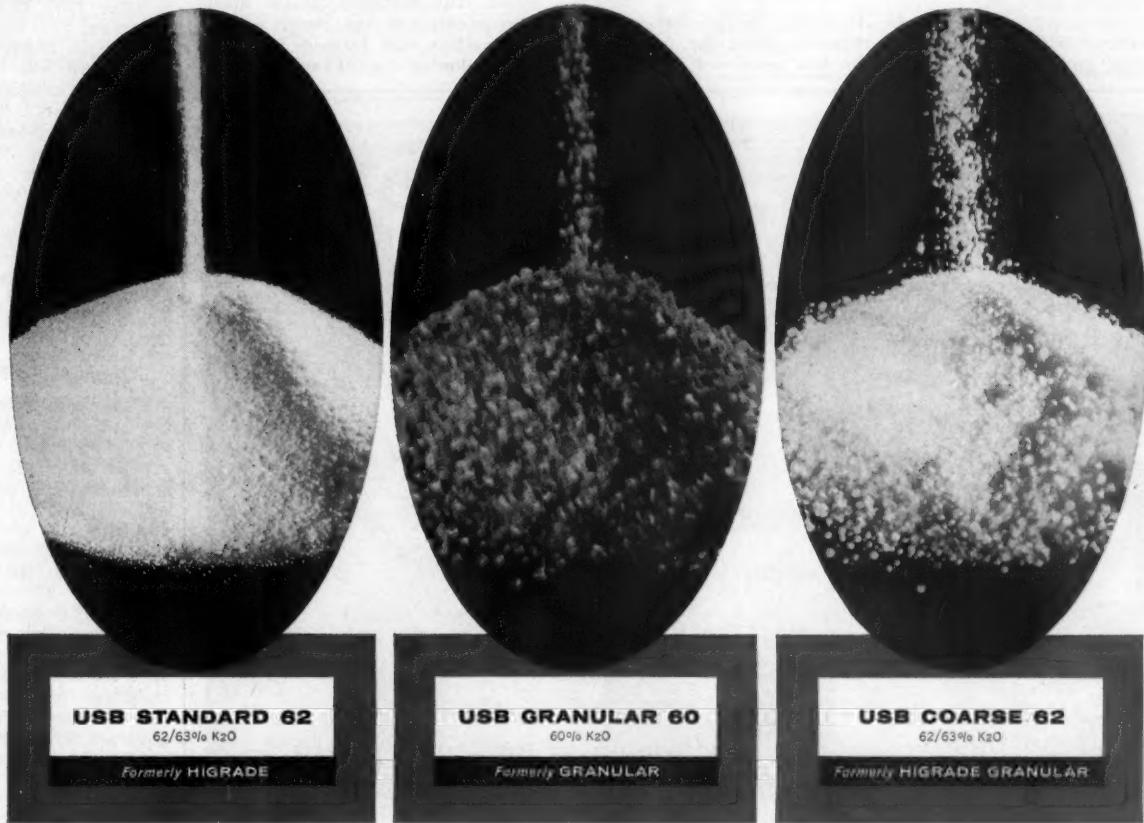
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By J. H. Yeager*

Department of Agricultural Economics
Auburn University
Auburn, Alabama

MANY factors influence profits from farming and the use of fertilizers. Some of these include government policies and programs, the cost of fertilizer relative to the cost of other resources used, and the returns or prices received for the products produced. The farmer's state of knowledge and his understanding of fertilizers and their use are also factors. In turn, fertilizer sales representatives play a key role in supplying dealers and farmers with facts. Times are changing rapidly. The

advances in technology have in many cases made the use of fertilizers more profitable. For example, with complete mechanization of production operations one can achieve better control of weeds, insects and diseases. Improved varieties and cultural practices also help to increase yields. With increased yields, unit costs are normally reduced. This affords higher returns to the resources such as fertilizer used in the production process.

Alabama farmers spend about \$50 million each year for fertilizer and lime. In 1958, farmers in Alabama spent \$44.8 million for fertilizer and lime which was 12.5% of total production expenses. In 1950, fertilizer and lime expenditures were 21.3% of total production expenditures. Farmers in the U.S., as an average, spend about 5% of total production expenditures on fertilizer.

In Alabama, the proportion of total expenses going for fertilizer and lime has decreased while ex-

Conference Speaker Declares . . .

Fertilizer Trade Must Profits Gained From

penditures for feed and livestock have increased since 1950. Apparently many Alabama farmers are getting returns from investments in feed and livestock that compete quite favorably with those from the use of fertilizers. Competition for the farmer's expenditure dollar means that the facts on returns for the use of fertilizer and lime must be made available and understood. The fertilizer dealer must also understand and recognize the alternatives that farmers have for use of limited capital funds.

Relative changes in costs of items that farmers buy affect the quantity of production items used. If the cost of a production item increases, producers generally tend to use less of the item. However, the changes in quantity used as a result of a price change must be considered together with the changing cost of substitute items. Farm labor and machinery afford an example.

Since 1950, farm wage rates have increased 51% while farm machinery costs have increased 41%. As a result, more and more farmers have turned to substituting farm machinery for labor.

Fertilizer prices have increased only 6% since 1950. Prices paid for feeds, livestock and seed have declined since 1950. Items of farm origin generally have declined while those items used in production that are of nonfarm origin have increased. USDA economists predict about the same pattern in increased costs of nonfarm items between 1960 and 1965.

Changes in Prices Received

Changes in prices received by farmers probably influence fertilizer use. If prices received increase while costs remain about the same, farmers generally find it profitable to apply additional amounts of fertilizer. They can afford to go further out on the fertilizer response curve.

Since 1950, the index of prices received for all commodities has declined. The decrease in prices received by Alabama farmers for all commodities and all crops was about 10% from 1950 to 1960. The decline in prices received together with a 5% increase in fertilizer prices and government policies and programs are important factors in the decrease in amount spent for fertilizer from 1950 to 1958.

How Much Fertilizer to Use?

How much fertilizer to use is an important decision to farmers. What kind of fertilizer, how to apply it, and when to apply it are equally important decisions. However, to simplify the economics involved, consideration will be given only to the question of how much fertilizer.

Dr. J. T. Cope, Jr., of the agronomy department of Auburn summarized data from 309 experiments carried out at various locations in Alabama from 1925 to 1952 on the response of corn to nitrogen. It is assumed that plant nutrients other than nitrogen were not limiting factors.

Results show that as more nitrogen was applied there was less response to nitrogen. This is a characteristic of almost all response curves. The cost of nitrogen was charged at 12¢ a pound and the price or value of corn was assumed to be \$1.20 a bushel. Value of the first 30 lb. nitrogen applied in terms of the additional corn produced by this nitrogen was \$21.60. In other words, \$3.60 spent for nitrogen returned \$21.60. This is \$6 return for each dollar spent for the first 30 lb. nitrogen applied. The second 30 lb. nitrogen returned \$19.20, the third \$18.20, and the fourth \$6. Based on an estimated increase in yield for the fifth 30 lb. unit of nitrogen, there was a return of only \$1.20.

Therefore, the return was less than

SYMBOLS OF PLANT LIFE



A 20TH CENTURY SYMBOL FOR HIGHEST QUALITY POTASH

In the middle ages, working with little help from prior research, alchemists frequently developed materials by accident.

TODAY, MATERIALS ARE DEVELOPED BY PLAN TO MEET A NEED—JUST AS EACH TYPE OF HIGH-K MURIATE IS MADE TO MEET SPECIFIC REQUIREMENTS.

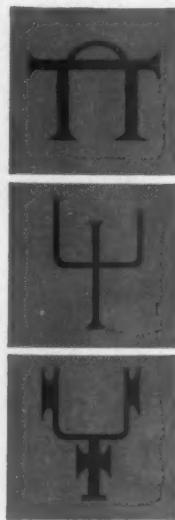
STANDARD HIGH-K MURIATE IS TAILOR MADE FOR CONVENTIONAL FERTILIZER MANUFACTURE AND VARIOUS RATIOS OF GRANULATED GRADES. IT FEATURES UNIFORM PARTICLE SIZE RANGE AND CHEMICAL ANALYSIS.

COARSE HIGH-K MURIATE IS USED IN THE MANUFACTURE OF CONVENTIONAL FERTILIZER AND IS ESPECIALLY USEFUL IN GRANULATION PLANTS. REASON: A CRYSTAL STRUCTURE WHICH DOES NOT BREAK DOWN WHEN ACIDS AND OTHER LIQUIDS ARE USED IN FORMULATION.

GRANULAR HIGH-K MURIATE IS A LARGER PARTICLE SIZE MURIATE FOR SPECIAL USE. SOUTHWEST POTASH PIONEERED THE PRODUCTION OF THIS ALL COMPAKTED PRODUCT.

OUR PLANT PROCESSES ARE CONTINUALLY BEING MODERNIZED TO SUPPLY TYPES OF MURIATE NEEDED AND PREFERRED BY FERTILIZER MANUFACTURERS. ON SCHEDULE SHIPMENT, CAR AFTER CAR, DAY AFTER DAY, IS MAINTAINED THROUGHOUT THE YEAR.

Medieval alchemists' symbols for potash and cibbed ashes



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*Portion of talk presented at Auburn Fertilizer Conference, July 18-19, 1961, Auburn, Ala.

Impress Users On Applying Plant Food

the cost of nitrogen at this level of application. It is obvious from these data that the greatest profit existed when between 120 and 150 lb. nitrogen were applied. This does not consider the small additional cost of harvesting the greater yield nor of applying the additional nitrogen. If total costs of producing corn were calculated for the various levels of nitrogen use, one would find that the cost per bushel decreased rapidly up to the level of 90 lb. nitrogen an acre.

Although the most profitable level of nitrogen use on corn appeared to be between 120 and 150 lb. an acre, many farmers do not apply this quantity. The major reasons appear to center in limited capital available for fertilizer use, the uncertainty or risks involved (droughts, excessive rainfall, price risks and others), and the existence of alternative uses for capital funds that may pay equally as well or better than funds spent for fertilizer. Also, alternative uses of funds may not involve the risk and uncertainty associated with crops and pastures.

Moreover, not only do various farm or production possibilities compete for limited funds, but also the home and family needs call for expenditures. In a recent housing survey of 665 rural residents in Alabama, Mississippi, Georgia and South Carolina, housing and business needs including farm needs, were not reported as requiring most urgently an expenditure of funds. Greatest needs, as reported, were for expenditures on items such as automobiles, television sets and boats.

With limited capital available farmers spread the use of their funds in order to get the maximum dollar return or the maximum satisfaction based on their value judgments. Theoretically, farmers distribute their limited capital so that any change in use of capital will not bring in any more income.

Suppose a farmer has \$4,000 to invest in livestock enterprises. How should he invest in order to maximize returns? The first \$1,000 should be invested in chickens, the second \$1,000 in cows, and the third and fourth \$1,000 in hogs. No other combination will yield as large return to the \$4,000. Any shift from this combination will yield a lower return.

There is still another aspect of fertilizer use for profits. This involves the substitution of one resource for another. Many farmers are more limited in capital funds than in cropland and pasture land. Therefore, they substitute acres for fertilizer. The example of corn response to nitrogen indicated that the first 30 lb. nitrogen gave a return of \$18 above the cost of nitrogen. Sixty pounds of nitrogen gave a return of \$33.60 above the cost of nitrogen.

In cases where land is not a limiting factor and the added costs of using land are relatively small, a farmer may apply 30 lb. nitrogen on each of two acres instead of 60 lb. or one acre. As a result, he would get \$36 return above the cost of nitrogen instead of \$33.60.

Returns for Fertilizer Use

It is important that these producers know what they are getting back for the fertilizer used. It is a challenge to assist farmers in calculating returns and in discussing how they might increase profits from changes

in fertilizer use and other practices.

In summary, we should say once more, that changes in agriculture are influencing farmers in their decisions about fertilizer use. Many alternative uses of limited capital funds are available to farmers today that were not available a few years ago. It is a challenge to the fertilizer industry, to researchers, and to educational workers to keep up to date, to supply the facts, and to work more closely with users of fertilizer and lime in order to increase their profits.

TABLE 1. Production Expenses of Farm Operators, Alabama and U.S.

Production expense item	Alabama			United States		
	1950	1955	1958	1950	1955	1958
Feed	29.1	48.7	81.1	3,283	3,840	4,512
Livestock	4.4	13.6	24.7	2,004	1,530	2,680
Seed*	9.5	8.9	9.3	531	577	534
Fertilizer and lime	51.9	50.0	44.8	978	1,256	1,305
Repairs and opn. of capital items**	35.3	45.4	53.6	2,921	3,423	3,788
Hired labor†	32.8	40.7	29.2	2,678	2,736	2,885
Miscellaneous††	28.1	35.8	36.9	1,750	2,167	2,468
Total current farm opn. expenses	191.0	243.1	279.6	14,145	15,529	18,172
Depreciation§	35.7	51.4	56.5	2,734	3,722	3,988
Taxes on farm property	6.0	6.8	7.3	919	1,149	1,346
Interest on farm mortgage debt	4.2	6.0	8.6	264	405	524
Net rent to non-farm landlords	6.9	7.1	5.3	1,233	1,057	1,122
Total production expenses	243.8	314.4	357.3	19,297	21,862	25,152
Fertilizer and lime as percentage of total	21.3	15.9	12.5	5.1	5.7	5.2

*Includes bulbs, plants and trees.

**Repairs on buildings and machinery and fuel and oil used in the farm business.

†Includes cash wages, perquisites and Social Security taxes paid by employers.

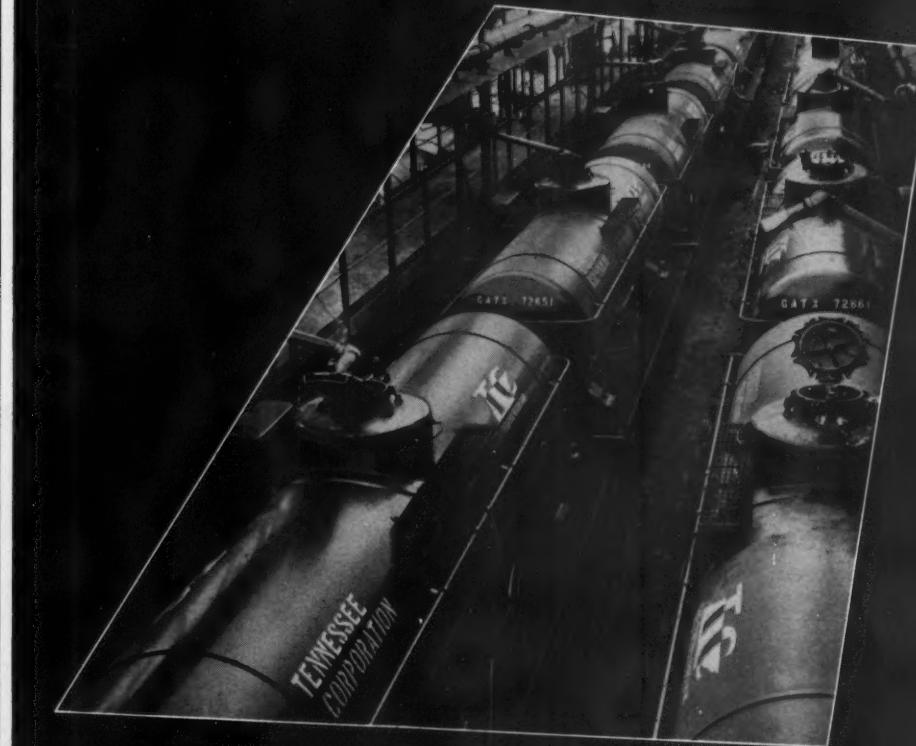
††Includes short-term interest, pesticides, ginning, farm share of electricity and telephones, supplies and other miscellaneous items.

§Includes depreciation on buildings, farm machinery, motor vehicles and other equipment.

Source: "Production Expenses of Farm Operators, by States, 1949-58," AMS, AED, USDA, Washington, D.C., October, 1959.

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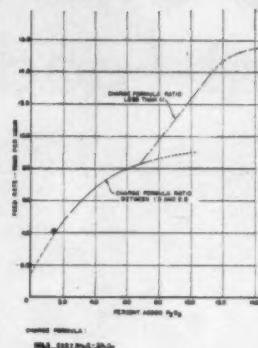
PRODUCTION PROCESS PATENTS

2,995,437

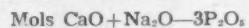
Defluorination of Phosphate Rock. Patent issued Aug. 8, 1961, to Clinton A. Hollingsworth, Lakeland, Fla., assignor to Smith-Douglass Co., Inc., Norfolk, Va. In the method of defluorinating phosphate rock which comprises heating the rock at an elevated temperature without substantial fusion in the presence of water vapor and of an added sodium compound of the group consisting of

sodium carbonate, sodium bicarbonate, sodium hydroxide, sodium phosphates and sodium chloride and an added acid phosphate compound of the group consisting of the phosphorous acids and their acid sodium salts, and maintaining the charge at said elevated temperature for a sufficient time to produce a defluorinated phosphate product, the improvement which comprises proportioning the relative amounts of phosphate rock,

silica, added sodium compounds and added phosphate compounds present in the charge mixture so that the weight ratio of the added sodium compound (calculated as Na₂O) to the added acid phosphate compound



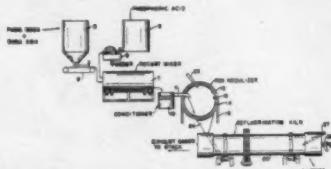
(calculated as P₂O₅) is between about 0.5 and 0.8, the amount of the acid phosphate compound (calculated as P₂O₅) added to the charge is between about 7% and 12% by weight of the total charge on a dry basis, the total amount of sodium compounds (calculated as Na₂O) in the charge is between about 0.3 mol and 0.7 mol per mol of P₂O₅ present in the phosphate rock, the silica content of the charge is between about 2% and 6% by weight of the total charge on a dry basis, and the CaO, Na₂O, P₂O₅ and SiO₂ content of the combined phosphate rock and added reagents is such that the mol ratio of these constituents in the formula



does not exceed 1.1, and heating the charge at a temperature of at least about 2200° F. and below that at which fusion of the charge occurs for a sufficient time to produce a phosphate product having high fertilizer availability and containing less than 1 part of fluorine per each 100 parts of phosphorus.

2,995,436

Defluorination of Phosphate Rock. Patent issued Aug. 8, 1961, to Clinton A. Hollingsworth, Lakeland, Fla., assignor to Smith-Douglass Co., Inc., Norfolk, Va. In the method of defluorinating phosphate rock which comprises heating the rock at an elevated temperature without substantial fusion in the presence of water vapor and of an added sodium compound of the group consisting of



2,996,426

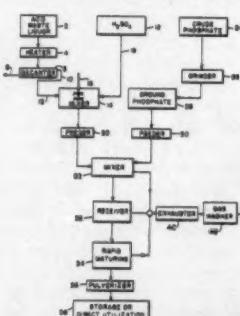
Pesticidal Composition. Patent issued Aug. 15, 1961, to Arthur L. Gallaway, Richmond, Va., assignor to Diamond Alkali Co., Cleveland, Ohio.

A biologically active composition comprising a finely-divided mixture of a pesticidal material selected from the group consisting of 1,1,1-trichloro-2,2'-di(p-chlorophenyl)ethane; O,O-diethyl-O-p-nitrophenyl phosphorothioate; S-(1,2-dicarbethoxyethyl)-O,O-dimethyl phosphorodithioate; 1,2,3,4,10,10-hexachloro-exo-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-endo-4,8-dimethanophthalene; dimethyl dichlorovinyl phosphate; 4-chlorophenyl-4-chlorobenzene-sulfonate; and benzene hexachloride, as an essential active ingredient, a stabilizing amount of a water-insoluble chlorinated paraffin wax having 18-36 carbon atoms in the molecule thereof and containing 40-80% by weight of chemically combined chlorine and a carrier, which carrier is chemically inert with respect to said pesticidal material.

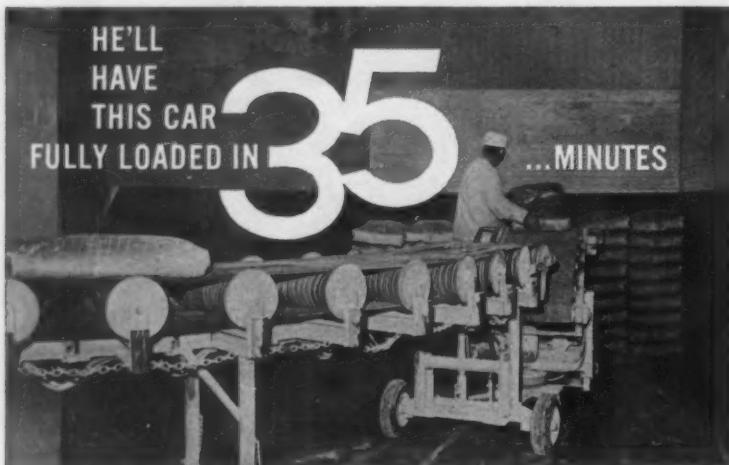
2,995,435

Process of Treatment and Utilization of Acid Waste Liquors Resulting from the Production of Acrylates and Methacrylates. Patent issued Aug. 8, 1961, to Pierre Hurel, Aunay-sous-Crepy, France, assignor to Societe d'Electro-Chimie, d'Electro-Metallurgie et des Acieries Electriques d'Ugine, Paris, France.

The process of treating waste acid liquor resulting from the production of acrylates and methacrylates to produce a phosphate fertilizer product, said liquor containing about 32 to 50% sulphuric acid and containing about 30 to 35% ammonium sul-



phate, which comprises adding acid which solubilizes phosphate rock to said liquor to raise its acid content to at least 52% by weight, reacting said liquor while at a temperature between about 70° C. and 85° C. with ground phosphate rock and recovering the resulting phosphate fertilizer product.



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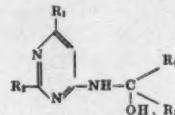
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2,994,637

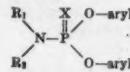
Aminopyrimidines as Fungicides. Patent issued Aug. 1, 1961, to Russell M. Bimber, Painesville, Ohio, assignor to Diamond Alkali Co., Cleveland, Ohio. The method of controlling fungus growth which comprises contacting said fungi with a toxic amount of a compound of the structure:



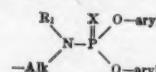
wherein R_1 , R_2 , R_3 and R_4 are selected from the group consisting of hydrogen atoms, lower alkyl radicals, phenyl radicals, phenyl-substituted methyl radicals, tolyl and xylyl radicals, and halogen-substituted derivatives of the same.

2,994,638

Agent for Combating Rodents. Patent issued Aug. 1, 1961, to Hugo Malz, Leverkusen; Adalbert Muller, Hallstadt, Bamberg, and Richard Wegler, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany. A method of combating rodents which comprises spraying cultivated areas which are infested with rodents with aqueous emulsions containing as an active ingredient a compound of the following formula:



in which X stands for a member selected from the group consisting of oxygen and sulfur, aryl stands for a member selected from the group consisting of phenyl, halogen-substituted phenyl and nitro-substituted phenyl; R_1 stands for a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, chloro-substituted lower alkyl, phenyl and chloro-substituted phenyl radicals; R_2 stands for a member selected from the group consisting of lower alkyl, lower alkenyl, chloro-substituted lower alkyl radicals and



wherein Alk is a lower alkylene radical and the other symbols have the above defined significance, R_1 and R_2 together with nitrogen can furthermore stand for a member selected from the group consisting of morpholine and piperidine—in a concentration of 0.05-1% of said active ingredient.

A method of combating rodents which comprises spraying cultivated areas which are infested with rodents with aqueous emulsions containing as an active ingredient the compound N-dimethylamidophosphoric acid-4,4'-dichlorodiphenyl ester.

2,994,636

Insecticidal Materials Produced by the Destructive Distillation of Gilsonite. Patent issued Aug. 1, 1961, to Nathan W. Davis, Salt Lake City, Utah. An insecticidal composition comprising: a vehicle, a bait, an attractant and a poison obtained by adding to 1 gallon of the distillate boiling between 355 and 360° F., obtained by the destructive distillation of Gilsonite, adding 20 ounces of xylene, 7 ounces of triethylolamine and 1 pound of silicon dioxide, heating under pressure to 300° F. and cooling, adding 1 gallon distilled water and 1 pint of turpentine and then distilling the same and removing that fraction boiling above 256° F.

2,994,599

Regulating Plant Growth. Patent issued Aug. 1, 1961, to Dougal H. McRae, Levittown, Pa., assignor to Rohm & Haas Co., Philadelphia. A process for selectively killing weeds among lawn grasses, which comprises applying to a lawn a compound from the class consisting of 2,3-dichloro-

isobutyric acid, and its water-soluble salts at a concentration and a rate sufficient to destroy said weeds without significant damage to the lawn grasses.

2,995,488

Synergistic Insecticidal Compositions. Patent issued Aug. 8, 1961, to Howard A. Jones and John A. Garman, Baltimore, Md., and Berton C. Dickinson, Lyndonville, N.Y., assignors to FMC Corporation, New York.

The method of killing insects which comprises applying to the insects and their habitat a synergistic insecticidal composition comprising O,O-diethyl-O-(7-(3-chloro-4-methylcoumaryl)thiophosphate and ethyl N-benzyl carbamate, wherein said components are present in the ratio of about five parts of said carbamate per part of said thiophosphate.

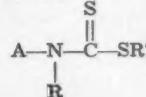
2,997,380

Control of Aquatic Plants. Patent issued Aug. 22, 1961, to Melvin Jay

Josephs, Midland, Mich., assignor to The Dow Chemical Co., Midland, Mich. A method for inhibiting the growth of aquatic plants which includes the step of introducing into water adjacent the submerged portion of the plants at least 15 parts per million by weight of a chlorinated phenyl-phenol having from 1 to 2 chlorine atoms in the positions ortho and para to the phenolic hydroxyl.

3,997,382

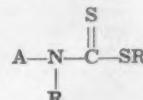
N-Haloalkenyl Dithiocarbanilates for the Control of Undesirable Vegetation. Patent issued Aug. 22, 1961, to Marion W. Harman and John J. D'Amico, Nitro, W.Va., assignors to Monsanto Chemical Co., St. Louis, Mo. A compound of the structure:



where A represents an aryl group se-

lected from the group consisting of phenyl and halogen substituted phenyl, R represents a halogen substituted lower monoolefinic group and R' is a radical selected from the group consisting of lower alkyl, lower monoolefinic and halogen substituted lower monoolefinic.

A method of controlling vegetation which comprises applying thereto a phytotoxic concentration of a compound of the structure



where A represents an aryl group selected from the group consisting of phenyl and halogen substituted phenyl, R represents a halogen substituted lower monoolefinic group and R' is a radical selected from the group consisting of lower alkyl, lower monoolefinic and halogen substituted lower monoolefinic.

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U.S. Borax and Mining Firm to Investigate New Potash Sources

U.S. Borax & Chemical Corp. and Homestake Mining Co. have entered a joint venture to complete studies relating to possible large scale potash production in Saskatchewan, Canada, where U.S. Borax has been investigating permits held since 1957, a recent joint announcement by the two companies disclosed.

U.S. Borax, a pioneer American producer of potash at Carlsbad, N.M., is the second largest producer of potash in the U.S. Homestake Mining has had extensive experience in gold and uranium mining.

If the completed studies indicate the technical and economic feasibility



of a Canadian potash operation, the two companies may participate equally in any company formed for such purpose. One or more additional associates may also be invited to participate in the future, the announcement said.

GATES PRESIDENT DIES

Charles C. Gates, 84, president of Gates Rubber Co., Denver, died Aug. 29. Mr. Gates founded the company in 1911. The firm manufactures tank linings for the chemical trade.

New Company Formed as Spencer Subsidiary

Spencer Chemical Co., Kansas City, Mo., announced on Sept. 1 the formation of a single company from two of the suppliers of flexible packaging materials which it recently acquired. The consolidation, effective Sept. 1, will bring Flexicraft Industries, Inc., New York City, and Wrapture, Inc., Flushing, N.Y., together as a single firm to be known as "Flexicraft-Wrapture, Inc.," Subsidiary of Spencer Chemical Co.

The new packaging manufacturer will be located in New York. It will be headed by Robert Burg, president, formerly president of Flexicraft Industries, Inc. Samuel Rivman, formerly president of Wrapture, Inc., will become vice president in charge of development for the new firm. Robert Siegel, formerly vice president of Flexicraft Industries, Inc., will become vice president in charge of sales.

The consolidation will not affect Crystal Tube Corp., Chicago, the other supplier of flexible packaging materials recently acquired by Spencer.

Monsanto Plans New Plant at Augusta, Ga.

Monsanto Chemical Co.'s Inorganic Chemicals Division will begin construction early next year of a plant at Augusta, Ga., to produce raw materials for the fertilizer, detergent, and metal treating industries. E. J. Bock, a Monsanto vice president and general manager of the division, has announced.

The plant, scheduled to go on stream early in 1963, will be located on a site of approximately 100 acres five miles south of Augusta's city limits.

Initially, the plant will produce phosphoric acid and sodium tripolyphosphate.

Neither cost nor capacity of the new plant has been announced.

St. Regis Inaugurates New Weather Service

The bag division of St. Regis Paper Co. has announced a new service for its customers in the agricultural, chemical, and other industries. The new service is in the form of a monthly forecast which helps these customers to determine how their businesses will be affected by the weather.

Called the "St. Regis Weather-vane," the service pinpoints, area-by-area across the country, what the weather is most likely to be a month in advance, and what it most probably will be the following two months. It is designed as an across-the-board marketing aid for members of various industries which package their products in multiwall and textile bags.

The detailed weather information is supplied to St. Regis by Weather Trends, Inc., a private weather forecasting agency which claims a record of 75% to 85% accuracy in its weather predictions. The report, in the form of a 4-page newsletter, is mailed to St. Regis customers a week before the beginning of each month.

See what you get... and can Guarantee with only 20 pounds of to a ton of fertilizer

Percent to total, by weight	FTE FORMULA 501	FTE FORMULA 502
B BORON	.02	.028
Cu COPPER	.02	.02
Zn ZINC	.04	.04
Mn MANGANESE	.049	.097
Fe IRON	.12	.039
Mo MOLYBDENUM	.0013	.0013

You get all six minor elements in a single product—and as little as 1% in your mix will meet most requirements for trace-element additives.

Being *fritted* and slowly soluble at a controlled, predetermined rate, FTE won't leach out—or become fixed in the soil. It stays in the root zone and releases the nutrients as needed, all through the growing season.

Two standard formulas are immediately available.

Others are being developed for specific areas of the country. All can be *safely used anywhere*, and on *any crops*, simplifying both manufacturing and marketing of fertilizers.

If you're not now using FTE, you'll find it profitable to do so. It costs but little, and can make a big difference—in the results your customers get; in your own future sales and profits.



FERRO CORPORATION Agricultural Division

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A good product with service follow-up sure pays off...

We get the best of both--quality and service--with Sul-Po-Mag

—John Ivey, pres., Southwest Fertilizer & Chemical Co., El Paso, makers of VITA-L complete plant foods

The success of our VITA-L premium depends on top quality ingredients. We can't afford 'will do' ingredients that can't carry a full nutritional load. That's why Sul-Po-Mag is part of our formula.

"We've tested VITA-L with Sul-Po-Mag in Arizona, New Mexico and West Texas. It works great. Sul-Po-Mag fits in so well because it's tailored for premium results.

"On cotton, for example, the benefits range from increased boll size to decreased disease problems. That's because premium ingredients, like Sul-Po-Mag, put

and we get a generous amount of technical and promotional assistance from our local Sul-Po-Mag representative."

* * *

Larger bolls and more of them, more to talk about and sell, a better opportunity for extra profit over your manufacturing investment . . . that's how Sul-Po-Mag adds to your sales advantage.

Sul-Po-Mag is double sulphate of potash-magnesia. It is 100% water soluble . . . granular, free-flowing to mix and stay mixed in your finished goods. Sul-Po-Mag resists leaching. It is fast acting, readily available to feed plants all season long.

And most important, Sul-Po-Mag fights magnesium-lag . . . the need for magnesium in all



Ivey, Nelson and Hoffman check out order of VITA-L.

back into the soil all of the nutritional elements needed for top yields and quality in this area.

"We use Sul-Po-Mag for another reason too. Service. Our SPM is here when we want it . . .



John Ivey and IMC's Hal Hoffman check upward sales curve of Southwest's VITA-L with SPM.



Ivey with Southwest's V.P., Nelson, and IMC's Hoffman talk Sul-Po-Mag and premium results.

cropland soils. Magnesium regulates the uptake of all other plant foods . . . Sul-Po-Mag supplies it in its most available form.

If your premium foods need extra vitality, ask your IMC representative for complete SPM details . . . and the full scale sales program that shows farmers everywhere the need for magnesium in top yields and quality.

SPM SUL-PO-MAG®

All farmland needs double sulphate of potash-magnesia. SPM contains 18.5% magnesia, 22% potash in sulphate form, 22% sulphur—and less than 2.5% chlorine.

How  promotes Sul-Po-Mag for you!



IMC continues to offer you the complete circle of Full Orbit Services. Recheck these services with your IMC representative — many of them have been expanded, many more are all new!

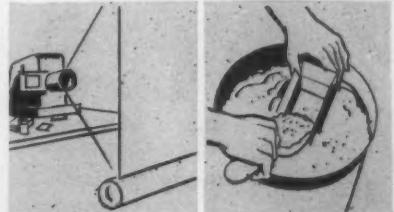
IMC also promotes Sul-Po-Mag direct to your dealers in their business publications. And — IMC promotes direct to your farm customers — warns of "Magnesium Lag" — through a heavy national, regional and local advertising schedule!

IMC promotes SPM for your dealers



It's the industry's most comprehensive dealer-help program! (1) Handy SPM flash cards give your dealers and their customers the complete SPM sales story fast and factually! (2) Authoritative SPM Bulletins reach county agents and vo-ag teachers. Loaded with research and university tests, the Bulletins prove SPM benefits, help sell for your dealers. (3) Specific SPM ads are beamed at potato, citrus, vegetable, fruit and tobacco farmers. (4) Dozens of local dealer materials and crop folders help your dealers move more Sul-Po-Mag!

IMC promotes SPM to your farm customers



(1) IMC supplies dealers with complete Sul-Po-Mag farmer-dealer meeting kits that outline every step of the way in holding a successful meeting. Available with the farmer-dealer meeting kit is the well-known "Magnesium — Major Plant Food" slide film with script. (2) IMC supplies recommendations on proper use and application rates . . . helps set up soil test service your dealers can offer their customers.

Want more SPM promotion and product facts? Call your IMC representative now!



INTERNATIONAL MINERALS & CHEMICAL CORPORATION

Agricultural Chemicals Division, Materials Dept. • Administrative Center • Skokie, Illinois

Swift Announces Construction of Sulfuric Acid Plant at Agricola, Florida, Location

Construction has started on a new contact sulfuric acid plant at Swift & Co.'s phosphate center at Agricola, Fla., it was announced recently by C. T. Prindeville, vice president.

The new unit will supplement two existing acid plants, tripling the present capacity, he said. The Leonard Construction Co., Chicago, has the contract for engineering, procurement and construction of a Leonard-Monsanto unit. The design includes innovations which Swift says will provide operating flexibility and efficiency. It is expected the new facility will be completed in April, 1962.

Output of the new acid plant will be used to treat rock phosphate mined at the site. Resulting phosphoric acid will be used in the production of the company's various

plant foods. Phosphoric acid also will be used in the production of concentrated phosphate compounds.

Construction of the new sulfuric acid plant is part of Swift's long-range program for expanding its agricultural chemical business, according to Mr. Prindeville. Swift will be associated in projects with a total investment of about \$30 million in the next two years, according to previously announced plans.

Swift presently mixes plant foods and pesticides, mines and processes phosphate rock, and produces phosphoric acid and related products.

**Plan to Attend the
ROUND TABLE**
Washington, D.C., Nov. 8-10

Hercules Powder Forms New District Office

The establishment of a new district office at Louisiana, Mo., to handle sales and service of its agricultural products was announced by Hercules Powder Co.'s agricultural chemicals division. The new office will service a fourteen-state area with agricultural chemicals, including pesticides and plant foods, the company said.

Appointed to staff the new district office were: Henry F. Pierce, district manager; Don M. Allison, an agronomist, senior technical sales representative; Dr. Robert E. Ogle, a horticulturist, senior technical sales representative; Harry W. Cannon, an agronomist, technical sales representative, and Richard Grimm, sales correspondent.

Mr. Pierce, an entomologist with years' experience in agriculture, joined Hercules in 1951.

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They're four of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into products and services you can use.

Services you can use

Traffic Service: Cyanamid traffic specialists are ready to route and ship your orders without delays. Their knowledge can save you money, and can make your operation run even more efficiently.

Technical Service: Cyanamid's staff of technical experts are constantly at your service. Make your formulation and production problems theirs. That's their job.

Sales Service: Cyanamid sales representatives are available to work with and for you in expanding present markets or in establishing new markets.

Products you can use

Cyanamid's phosphate business is the mining and manufacturing of the highest quality products for your mixed fertilizer requirements.

- Florida Natural Phosphate Rock.
- TREBO-PHOS® — Triple Superphosphate.
- Phosphoric acid — an economical source of P₂O₅ for high analysis fertilizers.

American Cyanamid Company, Agricultural Div., Princeton, N. J. ©TREBO-PHOS is American Cyanamid Company's trademark for its triple superphosphate.



One of Cyanamid's prospecting crews checks a sample just taken from the well. Their work in locating and verifying phosphate deposits is essential in maintaining adequate reserves of mineable, high-grade phosphate rock for your requirements in future years.

Speakers Named For Northeast Fertilizer Meet

Plans are nearing completion for the annual Northeast Fertilizer Conference to be held Oct. 12 and 13 at the Schine Inn, Chicopee, Mass. Dr. Merle V. Adams, Northeast Regional Director for the National Plant Food Institute, has announced.

He said the speakers would include Dr. Herbert Albrecht, director, Pennsylvania Agricultural Extension Service, whose subject is "The Future of Northeastern Agriculture and Its Effect on the Fertilizer Industry"; Derl I. Derr, assistant secretary, The American Bankers Assn., on "Financing Northeastern Agriculture in the 60's"; and George Doherty, executive vice president, Topco Associates, Inc., on "What Fertilizer the Grocery Shopper Will Buy."

Speakers scheduled for Oct. 13 include Dr. Martin Weeks, professor of agronomy, University of Massachusetts, on "Fertilizer Placement"; Dr. Cecil Brown, professor of agronomy, University of Maine, on "The Role of Fertilizer in Increasing Yields and Decreasing Unit Production Costs"; and Dr. Nyle Brady, head, agronomy department, Cornell University, on "Factors That Limit Response to Fertilizer."

Entomologists Plan November Convention

The Entomological Society of America will hold its annual meeting Nov. 27-30 at the McAllister and Columbus Hotels, Miami, Fla., with more than a thousand expected to be in attendance, according to an announcement by ESA. Dr. F. S. Arant, president of the society and head of the department of zoology and entomology at Auburn University, Auburn, Ala., said that more than 200 papers will be presented at the meeting.

Dr. J. E. de Wilde, director of the Agricultural University of Wageningen, The Netherlands, is one of nine invited speakers. Dr. de Wilde is a leading experimentalist in entomology from an international point of view, according to Dr. F. Gray Butcher, Miami University arrangements committee chairman.

Nine separate sections will meet in separate and general sessions during the four days of concentrated program. Control of insect pests by safe use of chemicals, by biological control and by relatively novel methods will be a major subject of consideration by research, extension, industrial and practicing entomologists attending, Dr. Arant said.

GULLS GOBBLE GRASSHOPPERS

An "air raid" which turned out to be a welcome sight to an Ohio farmer, did a good temporary job of controlling a heavy infestation of grasshoppers in a 17-acre wheat field. The farm, near Medina, Ohio, some 17 miles inland from Lake Erie, was the target area for the raid of 500 hungry seagulls who suddenly swooped down on the field for a gastronomical orgy of feasting on grasshoppers.

According to Alfred J. Glaser, who was plowing the field which had recently been harvested, the gulls suddenly appeared "out of nowhere" and began their work in eager hops and gulps. The noise of their feasting was a most unusual one, the farmer reported.

Having cleaned up practically every grasshopper in sight after the work of an hour or so, the heavily-laden gulls flapped their way back to the waters of lake Erie, leaving a grateful Mr. Glaser in their air-wash. "I sure hope the gulls keep coming back," he said. "They were here last year, too, and after they left, there wasn't a grasshopper in sight."

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Fertilizer Formula # 10

Date Aug 1961

Nitrogen 12

P₂O₅ 12

K₂O 12

Pounds	Materials	Analysis			Pounds per ton			Units per ton			
		Nitrogen	Available P ₂ O ₅	Potash	Nitrogen	Available P ₂ O ₅	Phosphorus	Nitrogen	Available P ₂ O ₅	Muriate of Potash	Sulphate
381	Ammonium Sulfate	21			80			4			
	Nitrogen Solution										
	Sulfuric Acid-66% ^b										
	Superphosphate	20									
	Superphosphate		46								
	Potash			60							

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Improve those high nitrogen formulas with USS Ammonium Sulfate for the top units of nitrogen. USS Ammonium Sulfate makes formulating easier, offers better-conditioned mixes and maintains higher production rates—because USS Ammonium Sulfate is dry, stable, economical and easy to handle. When you figure those high nitrogen grade formulations for this fall—think of USS Ammonium Sulfate. USS Ammonium Sulfate is guaranteed 21% nitrogen and 24% sulfur. Fast, dependable service readily available from several plants. Contact your USS Chemical representative or nearest USS Chemical Sales Office: Pittsburgh, New York, Chicago, Salt Lake City and Fairfield, Alabama. Place your order now for USS Ammonium Sulfate—another quality product of United States Steel.



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TRADEMARK

Airlift of Pesticide Stops Armyworms in March Through Cottonfields in Egypt

Emergency shipment of two million pounds of a single insecticidal product, said to be the largest airlift in commercial aviation history, was hastened to Egypt during a two-week period in August. According to officials of Union Carbide Corp., makers of "Sevin," the pesticide sent to control a major infestation of armyworms in Egypt, production of the product was temporarily diverted for conversion to sprayable form and rushed overseas to meet the armyworm threat against Egypt's cotton crop. Damage caused by the worm exceeded \$25,000,000, Egyptian officials said.

Dr. Richard H. Wellman, manager of Crag Agricultural Chemicals of UCC, said that this move was made "to prevent a catastrophic loss of the Egyptian cotton crop and a dire threat to basic food crops from this unprecedented plague of *Prodenia litora*."

In recounting the chronology of the air lift, UCC reports that during the weekend of Aug. 12-13, U.S. Air Force Military Air Transport Service airlifted more than 60 tons of Sevin from Andrews Air Force Base, Washington, D.C., to Cairo. The U.S. government acted in response to an urgent appeal from Egyptian officials to help avert a crisis in Egypt's major agricultural crop.

By Monday morning, Aug. 14, UCC reports, a million pounds of the insecticide had been delivered by air to Cairo. The airlift was to continue through Aug. 23, by which time orders from Egypt were expected to exceed two million pounds.

The Egyptian government purchased the insecticide at a cost of

more than \$2 million to protect the cotton crop, grown in the Nile River Valley, from the armyworms in the fertile agricultural region. The plant-chewing worm pests threatened to wipe out cotton, corn and other crops by devouring any fields in their path.

Jets, four-engined DC 6's, DC 7's and Constellations all are involved in the insecticide flights. Union Carbide said this is the largest air freight operation since the Berlin airlift. Some planes flew directly to Cairo, according to the company, others went to Europe where the insecticide was transferred to different planes for the run to Egypt. Every possible means of air transportation was called into play by Union Carbide International Co.'s traffic department.

Airlines involved in the insecticide movement included Alitalia, Irish Airlines, Swissair, Pan American, TWA, KLM, and Pakistan Airlines.

UCC organized round-the-clock operations to move the material to Idlewild International Airport in New York. Packed as a powder, the insecticide was shipped overseas in fiber drums. Upon arrival in Egypt, Sevin was mixed immediately into a spray for field use.

The march of the armyworms across Egyptian cropland was said to be reminiscent of locust plagues which have harassed the Middle East since Biblical times. Large areas of farmlands were literally crawling with the worm pests.

Reports from Egypt indicate that the efforts were successful in halting further damage by the armyworm infestation.



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It's results that count when pesticides are applied for pest control . . . and the farmer is depending on you to use a carrier which GETS THE JOB DONE BEST!

For better Pesticidal ACTION
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CREEK-O-NITE CLAY

A 1960 test at the University of Wisconsin, against the northern corn rootworm, showed 3.5% corn lodging where ½-pound per acre of Heptachlor was used as a row treatment (Involving 10% Heptachlor on 24/48 CREEK-O-NITE granules.) Untreated corn had 96.6% plant lodging in this experiment!

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WINGED INSECTICIDES—Airlift of two million pounds "Sevin" insecticide to Egypt to control infestation of armyworm in Nile Valley cottonfields claimed to be biggest commercial airlift ever flown. Top photo, loading fiber drums of powdered material at East Coast airport. Middle shot shows Egyptian workers at Cairo airport unloading insecticide on trucks for fast trip to agricultural area where material was sprayed on cotton fields as pictured in lower photo.

National Phosphate to Enlarge Facilities

National Phosphate Corp. has completed plans to substantially expand its facilities at Marseilles, Ill. The multimillion dollar expansion will include an approximate tripling of phosphoric acid capacity, the upgrading of a portion of the acid to diammonium phosphate, and construction of a sulphuric acid plant and a molten sulphur terminal.

National Phosphate Corp., founded less than two years by Erol Beker, president and chief executive officer,

brought its first unit into production last February. It is anticipated that its new expansion will be on stream by the second quarter of next year. With the assistance of Empire Trust Company's Chemical Department, financing has been completed, and construction is now under way.

In addition to these immediate plans, National Phosphate Corp. says it is expanding its research and development activities in a number of fields, including industrial phosphates and other allied chemicals.

Fertilizer Industry Should Play Big Role In Telling Story of Plant Food Economics

Challenges to the Mississippi fertilizer industry to play an even larger role in helping to inform farmers of the facts about plant food highlighted the second annual convention of the Mississippi Soil Fertility and Plant Food Council at Biloxi Aug. 10-12.

W. F. Harris of Jackson was elected president for the year ahead, succeeding Mike R. Blouin, Jr., of Memphis and formerly of Columbus. Other officers, also of Jackson, are W. L. Ashley, vice president, and Gene A. Triggs, secretary-treasurer.

Fertilizer sales should be based on a lot besides price, said A. P. Gates, vice president, Virginia-Carolina Chemical Corp., Richmond, Va. "The industry is selling profit, service, insurance, new ideas and ourselves and our companies," he said.

"We are selling the farmer profit which, in turn, means a better standard of living for him and his family."

"The best protection a farmer has against falling prices and the cost-price squeeze is the use of recommended amounts of fertilizer, along with other good farming practices that lead to efficient production," Mr. Gates pointed out. "Proper fertilization cuts unit costs of production."

Dr. R. W. Pearson, soil scientist, Agricultural Research Service, U.S. Department of Agriculture, Auburn, Ala., spoke in the place of Frank J. Welch, Assistant Secretary of Agriculture.

While strongly encouraging soil conservation, Dr. Pearson pointed out that it is not without problems unless good over-all farm management is followed.

"Soil fertility is very closely related to conservation of soil and water resources. In fact, you can't have conservation without close attention to liming and fertilizer programs," he said.

Competition in farming requires more production per unit, but this must be reconciled with conservation, Dr. Pearson explained. He discussed the problems involved which include soil acidity, making better use of plant nutrients applied, better use of available moisture from rainfall, nutrient depletion by crops that are thought to be soil conserving, and subsoils exposed by land leveling and other practices.

A report on the short and intermediate-term credit offered by the Production Credit System was given by R. E. Spivey, Jr., assistant to the president, Federal Intermediate Credit Bank of New Orleans.

W. R. Thompson, leader in agronomy of the agricultural extension service of Mississippi State University, and others of his staff reported the results of a survey of several counties comparing the average

yields of farmers who applied the amounts of mixed fertilizer recommended by the experiment station and the results of soil testing with those of farmers who applied less fertilizer. For example, farmers who used the recommended fertilizer rate for corn averaged 53 bu. an acre, while those using less averaged 37 bu. an acre. Fertilizer made the difference between 548 and 429 lb. of lint cotton per acre on the farms studied.

"Mississippi agriculture's greatest opportunity for expansion in crop production is the wise use of fertilizer," Mr. Thompson declared.

"The labor requirement on crops is about the same whether enough fertilizer is used or not. But if the fertilization is right, the income is much higher," he pointed out.



NEW OFFICERS—New officers of the Mississippi Soil Fertility and Plant Food Council, elected at the organization's recent convention at Biloxi, Miss. are seen above. They are, left to right, W. F. Harris, Jackson, Miss., president; W. L. Ashley, vice president, and Gene A. Triggs, secretary-treasurer. (Photo by Mississippi Extension Service.)

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POTASH EXPANSION IN ISRAEL

Expansion of its potash facilities at the south end of the Dead Sea in Israel has been announced by the Dead Sea Works, Ltd. Present potash production of 150,000 tons by the company will be increased to nearly 600,000, with plans to raise production figures higher later.

When the expansion program is completed in 1965, the Dead Sea Works expects its exports of potash and other chemicals to rank next to citrus as Israel's most important source of foreign exchange earnings.

The current program is expected to cost the equivalent of approximately \$70 million. About half this amount will be provided by the company itself, and the remainder from a \$25 million World Bank loan and other borrowings.



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Production

MAN

of the MONTH

Dee Dibble Supervises

Production Activities

At Northern Iowa Plant

BEING a knowledgeable leader and director of production activities in a large fertilizer plant is a job requiring a number of skills, as can be attested by men in such positions in many facilities around the country. This is true of Dee L. Dibble, superintendent of the Mason City, Iowa, fertilizer manufacturing unit of the plant food division of International Minerals & Chemical Corp.

The plant is large . . . employing more than 100 workers during the busy spring season. The superintendent's responsibilities include over-all supervision of these men and seeing that production schedules are met. products are up to analysis, and that company rules concerning safety practices are being observed.

Mr. Dibble has plenty to do during his working day at the plant. He oversees the formulation of mixed dry fertilizers, sulfuric acid, liquid fertilizers, lawn and garden fertilizers and hydrofluosilicic acid. The

plant facilities include a Leonard Monsanto sulfuric acid plant and a complete granulation unit.

The superintendent has been with International Minerals for some 12 years, starting in 1949 as a production trainee, immediately following his graduation with a degree in chemical engineering from Michigan College of Mining and Technology. Following his training period at IMC, he was made assistant superintendent of the company's plant at Cincinnati, Ohio.

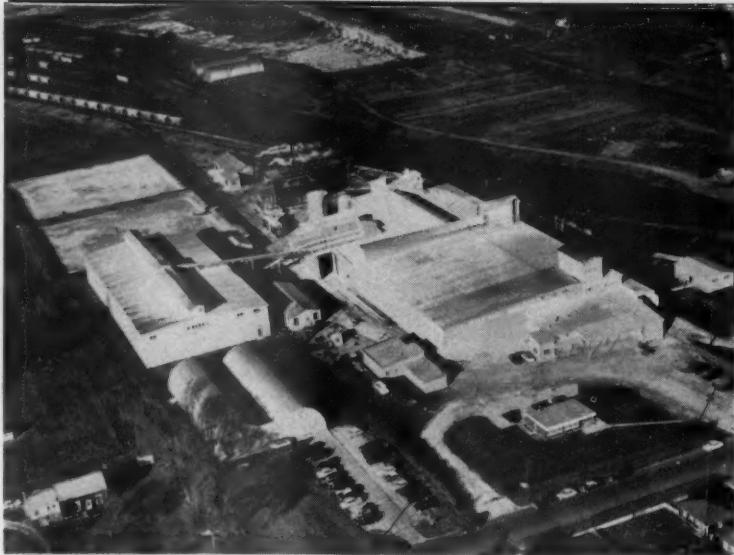
Having been successful in his work in Ohio, Mr. Dibble was transferred in 1951 to Mason City as assistant superintendent to operate the sulfuric acid plant.

Four years ago, he was promoted to the position of superintendent.

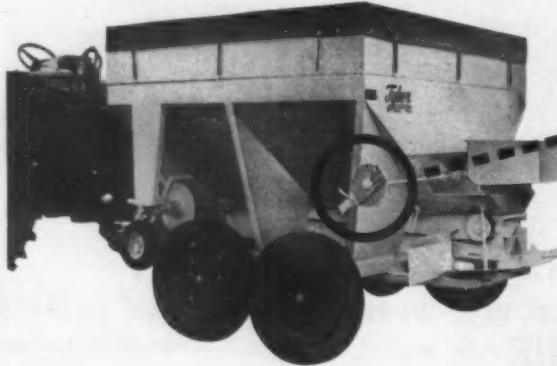
Aside from his exacting duties at the plant, the superintendent devotes a considerable amount of time and energy in various civic and professional group activities. He serves on the boards of the Mason City Chamber of Commerce, the Country Club and St. John's Episcopal Church. He is also a senior member of the American Institute of Chemical Engineers. And, when there is time, Mr. Dibble likes to golf and hunt.

Dee and his wife have a 17-year-old daughter, Stephanie Dibble, who expects to enter college as a freshman this fall.

PRODUCTION HABITAT—Dee Dibble, above, right, is superintendent of Mason City, Iowa, plant of International Minerals & Chemical Corp., shown in lower photo. Plant employs more than 100 during busy season in spring. Mr. Dibble oversees their work, keeps safety record at a good level, and makes sure production schedules are met on time.



Every once in awhile a good idea comes along in any business—and a year ago it happened in the fertilizer industry when TYLER introduced the F2 Tractor Spreader and with it a new system of fertilizer application. Common sense engineering and practical merchandising has put hundreds of F2's in the field with excellent customer acceptance—and they're DOING THE JOB!



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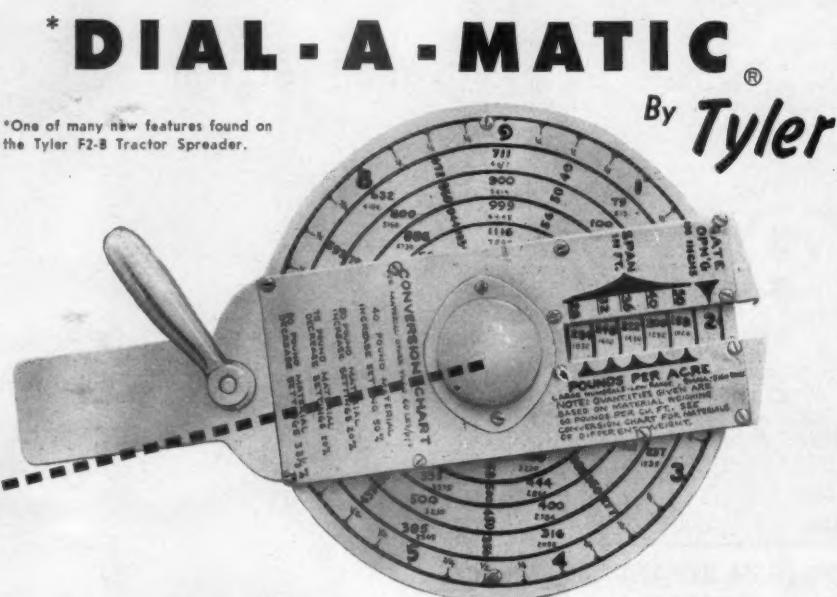
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ACRE YIELD CONTROLS

Continued from page 2

the normal yield base as being perhaps more realistic as a means to control surpluses. By shifting the base, the expansion of crop production through good weather and optimum application of plant food would thus be thwarted.

The question has been raised in Washington about the attitude of Dr. Cochrane regarding hybrid seed corn. Had his current policy been dominant in agriculture when the hybrid seed idea began, would he have been willing to apply the check-rein on this development to slow down corn production? Leaders in the fertilizer and pesticide trades are wondering now whether Dr. Cochrane might not be running out of bounds in his determination to make his own supply-management ideas work.

There is one good clue to determining the direction of the administration . . . Dr. Cochrane's documentary book, "Farm Prices—Fact or Fiction." Upon reading it, one can comprehend what Dr. Cochrane contemplates and where he is going.

Now, as the 87th Congress nears the end of its current session, the per bushel or per pound theory has already gained an important foothold, with 26 Senators recently putting their signatures to a proposal that price supports be geared to acreage yields per unit. These Senators represent the wheat states and they confirm the position Dr. Cochrane has assumed, although he was not the first advocate of that basis for price support. Dr. Cochrane appears to maintain the theory of a high level of support, but quietly rejects the acreage control option per se.

Dr. Cochrane may be fascinated but perhaps slightly alarmed at the gathering of the wheat state senators in behalf of the yield per acre basis, in view of the concentration of attention to the two price system from the hard red winter wheat states. He has contemplated the farm economy from the academic halls of the university—although quite without support from his collegiate superiors. Now he seems to have been joined by the wheat state politicians who sense perhaps a two price system through a sly gain they wish to obtain from the Congressional elections next year.

They may even foresee Dr. Cochrane as a sharp running horse who could win the farm Congressional sweepstakes in the fall of 1962.

However the whole issue rejects the aspects of the agricultural chemical industry in its possibilities of greater yields per acre at declining costs per unit of yield.

If the national policy is to dump through Public Law 480, or other devices to take care of agricultural surpluses for a long period of time, perhaps Dr. Cochrane may be timing his philosophy to a classroom concept in rejecting the opportunities that the agricultural chemical industry offers to agriculture.

One may only recall an observation which the agricultural economist Theodore Shultz of the University of Chicago said some years back, to the effect that nitrogen would do for the

corn crop in a few years what it took the hybrid seed corn crop 20 years to accomplish.

This item is set forth to describe the inherent factors in the Cochrane theories. It also may serve to alert the agricultural chemical industries of the impending situation.

Dr. Cochrane is writing policy at USDA. Secretary Freeman may be grasping at the credit and in some respects modifying the Cochrane philosophy to meet what Mr. Freeman sees as political potentials in the farm belt in 1962. However the man who is making the Freeman outlook optimistic is none other than Dr. Cochrane. Industry leaders would do well to make his acquaintance and thus learn more of the direction likely to be taken by support prices.

N. Carolina Holds School For Fertilizer Salesmen

A soil fertility school for fertilizer and lime salesmen, and for bankers, was scheduled for Sept. 14 and 15 at North Carolina State College, Raleigh. The advance agenda said talks would be made by representatives of the N.C. college of agriculture, the National Plant Food Institute, and officials of banks located in the area.

The program called for presentations covering three themes: Tomorrow's Potential; Going From the Present to the Potential, and Selling at the Local Level.

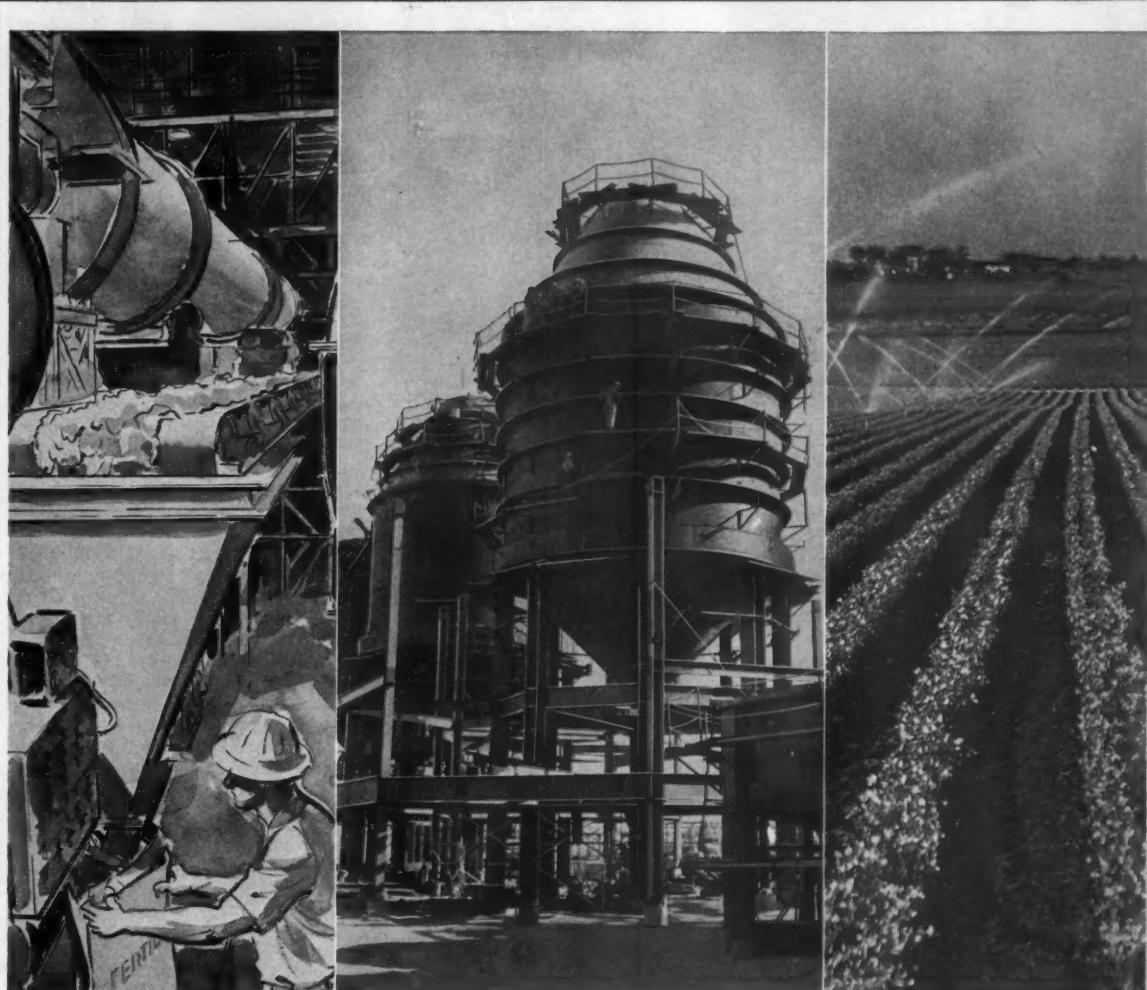
Speakers were to include J. W. Fitts, head of the department of soils, North Carolina State; George Smith, assistant director, agricultural extension service at the college; H. Brooks James, dean of the school of agriculture; Dr. R. L. Beacher, director, Southern Regional Office of

the National Plant Food Institute; L. Y. Ballantine, commissioner of the North Carolina department of agriculture, and R. W. Shoffner, director of the state agricultural extension service.

Bankers were to include Hector MacLean, president of the Southern National Bank, Lumberton, N.C.; Wayne Corpener, vice president of the Wachovia Bank & Trust Co., Winston-Salem, N.C., and Clyde L. Stutts, president, Union Trust Co., Shelby, N.C.

MANAGEMENT THEME

The 46th national meeting of the American Institute of Chemical Engineers will be held in the Lake Placid Club, Lake Placid, N.Y., Sept. 24-27. "Management" will be the theme of the meeting. Some 2,000 chemical engineers from all parts of this country and Canada are expected to attend.



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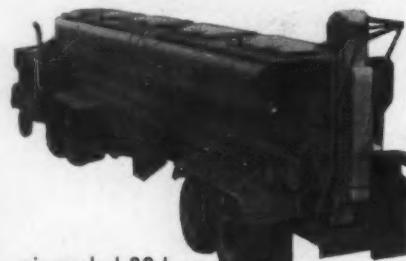
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AMMONIA PLANT

Continued from page 4

seen miles away by airplane pilots.

Air Force officials claimed that the yellow plumes were too visible for safety and recommended that the plant be shut down. This, however, was not permitted by other government officials and the yellow smoke continued. At that time it was impossible to buy enough stainless steel to build more towers to reduce the emissions.

Another situation recalled by old timers is the war-time presence of a large labor force of women. About 40% of the operating force were housewives brought into service at the plant. There were many problems in this connection, but still operations were maintained and the production continued at peak levels.

The plant today is said to be the largest in the free world, if not in the entire world. One plant in East Germany, it is said, might have a greater capacity than the 400,000-ton/year rated capacity of the Hopewell plant for ammonia.

The number of people employed at the Hopewell plant was probably the greatest during the war years. Efficiencies learned since that time have reduced the manpower significantly, while at the same time increasing output.

Innovations seen by a visitor at the plant include closed-circuit TV screens which enable one man at a great distance away to check on water levels in boilers as though he were standing in the room beside them. Also, closed-circuit TV is employed to cover gates and to inspect persons applying for admission through the gates. The addition of this type of equipment has aided greatly in manpower economy.

The plant burns about 1,400 tons of coal a day and uses 240 million gallons of water daily at peak summer demand. The plant site is on the confluence of the Appomattox and James rivers, which assures a constant and ample supply of water.

The presence of the waterways also provides additional shipping facilities, which are utilized considerably. Two railroad lines, the Norfolk & Western and Seaboard, are also beside the plant. Three locomotives are owned by the plant, and these switch cars to various places on the 15 miles of track within the plant confines.

A continuing safety program is carried out by the Nitrogen Division plant. A record of 3.3 million con-

secutive manhours has been worked without an accident. Current figures indicate that a new record may be on the way. All men in the plant are required to wear safety glasses, hats, and shoes. A "wise owl" club has been formed comprising men whose eyesight has definitely been saved through wearing of safety glasses. There are 15 or 20 of these men now in the club.

Safety shoes are sold to the men at cost. A never-ending safety crusade is formal policy of the company and has helped to make working conditions steadily safe throughout the plant.

The plant itself occupies about 600 acres of land, much of which has historic significance. The plant site adjoins the old Eppes estate, an original land grant, said to be the oldest in the U.S. to remain in one family. Also nearby is the first industrial plant site in America, which was a ceramics factory early in the 1600's.

Historic markers in the area record visits of Captain John Smith and other early notables dating back to 1607. Subsequently, the Revolutionary and Civil wars have made additional history in the area.

At the present time, however, the nitrogen plant of Allied is making its own type of history in the fertilizer industry.

TVA Consolidates Ag Activities in Alabama

Consolidation of the Tennessee Valley Authority's agricultural and chemical activities at Muscle Shoals, Alabama, was completed recently. Lewis B. Nelson, manager of TVA's office of agricultural and chemical development, reports. The consolidation was effected through the transfer of the agricultural relations division to Muscle Shoals from Knoxville, Tenn.

Involved in the transfer were about 60 employees, including the division's administrative offices and the test demonstration, distributor demonstration and agricultural economics branches. The move was made over a period of about two months.

Already located at Muscle Shoals was TVA's national fertilizer munitions development center consisting of laboratories, pilot plants and full-scale fertilizer production facilities. Also, the soils and fertilizer research branch of agricultural relations had been at the center for several years.

AAI Reports Ammonia Consumption Up 10% at End of Fertilizer Year July 31

Total usage of agricultural anhydrous ammonia is up 10% for the fertilizer year ending July 31 over that of previous year, according to survey figures just released by the Agricultural Ammonia Institute.

The institute's survey reached approximately one-fifth of the direct application ammonia. This indicates total tonnage in the U.S. of about 790,000 for the past year as compared with 717,000 tons for the 1959-60 year.

Jack F. Criswell, AAI executive vice president, said the survey showed 158,850 tons were used in 1961 against 144,718 tons for 1960, or a net gain of 14,132 tons ammonia.

The institute survey covered 24 states with more than 140 major distributors contributing consumption figures.

Not all of the distributors showed increases, Mr. Criswell pointed out. Reasons given for lower sales included the government farm program (reduced acreage planted) and adverse weather conditions which either hindered or prevented am-

monia application. Some of the dealers in the lower sales areas also said that adverse spring weather caused more land to be put into the government program.

“However, the ratio for dealers with increased tonnage was more than two to one, which provides a good note of optimism for the industry,” Mr. Criswell said.

Dealers stated that they had increased sales through greater promotional activity, including field demonstrations, farmer meetings and education, improved service, and more “on farm” attention to customers in addition to their normal sales and advertising activities.

During the Jan. 1-July 31 period, the dealers reported 36% of their ammonia went down preplant while 64% was used for sidedressing.

As to prospects for fall application this year, 15% of the distributors said they expected them to be “good to excellent.” Twenty-nine per cent indicated “fair” prospects, and 45% said “poor.”

MEN MOVING AHEAD

Continued from page 7

visions and departments. He will headquartered at IMC's administrative center in Skokie, Ill.

Ortho Division of California Chemical Co. has announced the appointments of 11 sales representatives to serve in midwestern territories with products made at the company's nitrogen plant now under construction at Ft. Madison, Iowa. According to R. C. Yapp, Midwest District manager for the Ortho division, the following appointments have been made:

Paul E. Hagen, territorial representative for central Wisconsin; **Frank W. Pelley**, for southeast Minnesota; **Lester J. Tesch**, in the Willmar, Minn., area; **Robert M. Gulbranson**, for southwest Minnesota; **David O. Chenault**, to cover western Kansas; **Charles A. Reed**, for southeast Kansas; **Johnny C. Burke**, in northeast Missouri; **Henry A. Bendorf**, for northeast Iowa; **James A. Forgey**, to cover southwest Missouri; **Bryce Abrams**, for southwest Wisconsin, and **Charles A. Zuber**, for northeast Nebraska.

Other appointments have also been announced by Ortho Division. **Rocky Ferrell** will be sales representative in Southern Ohio, and **James P. Hicks** in Indiana. **W. J. Majure**, Great Lakes district manager has announced. **Charles L. Button** will represent Ortho in the north Connecticut area, as announced by **R. T. Wallace**, New Jersey district manager; and **Joseph L. Roye** will be traffic representative for the new plant at Ft. Madison, according to **J. K. Pellett**, supervisor of traffic and transportation.

Corp. He will make his headquarters in Monroe, La.

William D. Morrison has joined Hooker Chemical Corp. in New York as general manager of the company's newly-formed international division, responsible to **F. Leonard Bryant**, president, who made the announcement.



W. D. Morrison



R. W. Finch



H. Edward Struble

The agricultural chemical division of Swift & Co. has appointed **R. W. Finch** district manager for industrial chemical sales, with jurisdiction over the western part of the Midwest and the Plains states. His headquarters will be at St. Joseph, Mo.

Since 1960, Mr. Finch has been manager of Swift's agricultural chemical division at St. Joseph. He has been with the company since 1934, and has held sales and administrative jobs in California and the Northwest, including a position as manager at the North Portland, Ore., agricultural chemical plant.

Succeeding Mr. Finch at St. Joseph is **H. Edward Struble**, who started with Swift in 1953 as a salesman in the New York metropolitan area.

David C. Rowan recently special representative of the Tokheim General Products Division has been named assistant sales manager of Chicago district.

In his new position, Mr. Rowan will maintain headquarters at the Tokheim Chicago office and will be directly responsible to **C. L. Mitchell**, district sales manager. Mr. Rowan has served as special representative of Tokheim General Products Division since March, 1961.



David C. Rowan

Appointment of **Paul H. Maple** as division manager for the New Leader division, Highway Equipment Co., Cedar Rapids, Iowa, was announced by **Gale E. Allen**, general sales manager.

Mr. Maple will cover nine southern states for the company.



P. H. Maple

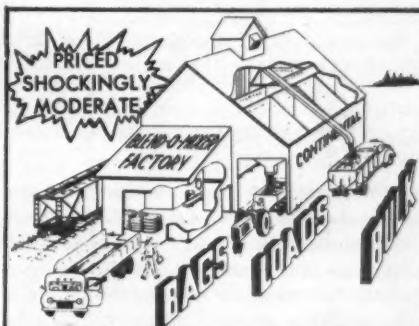
The election of **Morris E. Lasker** to the board of directors of Chase Bag Co. has been announced by **E. K. Ludington, Jr.**, president. A member of the New York City law firm of Battle, Fowler, Stokes & Kheel, Mr. Lasker will also serve as legal counsel for Chase.

As a Chase director, he succeeds the late **Ludlow S. Fowler**, who died April 12, 1961.

Davidson - Kennedy Co., Atlanta, has named **Homer Hansen** as sales manager. The announcement was made by Thornton Kennedy, president.

Mr. Hansen is a graduate of Purdue University with a degree in mechanical engineering. In his new position he will direct sales to the vegetable oil mill and fertilizer industry as well as expanding Davidson - Kennedy's sales to other industries requiring medium and heavy machinery design and manufacturing.

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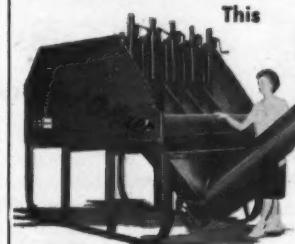
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Technology Advances . . .

Golden Anniversary of Fertilizer Research Finds Industry Continuing to Move Ahead

A HALF CENTURY of fertilizer research is being observed this year by the Agricultural Research Service of USDA. It was fifty years ago, back in 1911, that responsibility for research in fertilizer technology was assigned by Congress to the U.S. Department of Agriculture.

Many changes in technology have taken place in that time, to be sure. But one does not have to shift his memory into reverse very far to recall the days when farmers were probably impressed more by the dark color and pungent odor of fertilizer than they were by its plant nutrient content. Indeed, the day is not too far gone when users had little idea at all about the actual nutrient value of the material they were putting on their land.

But that day IS gone and today's grower needs to use very little guesswork in determining how much and what kind of fertilizer to apply. Chemical fertilizers are manufactured almost universally under skilled technical supervision and carefully controlled conditions.

Here is a brief rundown on the way fertilizer research has developed since it was initiated under USDA back in 1911, according to Department records:

The first Federal appropriation for fertilizer research was used to survey possible sources within the U.S. of natural fertilizers. Growth and accomplishments of USDA work in this field during the past half century strongly influenced development of U.S. fertilizer production.

World War I spurred research on fixation of atmospheric nitrogen. A pioneer experimental unit for synthesis of ammonia from air was built by USDA. Followup studies are credited with establishment of the synthetic ammonia industry, which today is the largest in the world. USDA personnel participated in commercial application of the process.

Other laboratory and pilot-plant operations led to manufacture of phosphoric acid by the furnace method. Extensive studies were made also on superphosphate ammoniation, composition and properties of phosphate rock, and other phases of phosphate technology.

Granular fertilizer mixtures having superior qualities for easier handling, storage, and field application have come from research on improving grade and physical condition of constituent materials.

Recent work includes studies of trace-nutrient materials, and behavior of pesticides and other agricultural chemicals in mixtures with fertilizers. USDA initiated preparation and distribution of radioactive fertilizers for use in research. They are contributing new knowledge and understanding of complex soil-plant-nutrient relationships. These and other studies now being conducted promise to make still more efficient the use of fertilizers in crop production.



ONE MOST helpful way in which industry people keep abreast of current developments in fertilizer manufacturing technology is through attendance at the annual Round Table meeting in Washington, D.C. This year's session, scheduled to be conducted at the Mayflower Ho-

tel, Nov. 8-10, will add yet another chapter to its illustrious history covering more than a decade.

Manufacturers in the trade have much to gain in having representation at the Round Table. Last year's 10th anniversary meeting attracted some 600 of the industry's best production people, all of whom took home with them numerous ideas and suggestions. These helps, all of practical nature, are of tremendous potential value to the production man who may have few opportunities, aside from the Round Table, to talk with his counterparts who wrestle with the same problems as he does.

The formal program is of practical nature, with speakers chosen for their training and experience to lead discussions and to impart knowledge to production people in the audience. But beyond the formal program are opportunities for exchange of ideas and experiences among fertilizer production people from many different types of plants and from various portions of the country.

Special emphasis this year will be placed on materials handling problems and how to cope with them. Discussions on new methods of moving dry plant food materials as well as liquid products will be on the agenda, as well as helpful talks on presently-used techniques.

Dust control in the plant will also come in for discussion, as will numerous other phases of fertilizer production.

The idea of an open forum for production people of the industry is a sound one, as has been proved by the more than a decade of Round Tables. The meeting of minds and exchanging of ideas in an atmosphere of helpfulness and eagerness to learn can be most beneficial to the entire industry. But especially is this true of the men who actually attend the meeting in Washington.

We trust that if some manufacturers may be still undecided whether or not to send their superintendents or other key people to the Round Table, the decision will be affirmative.

Fall Sales Prospects Appear Good This Year

ALL SALES of fertilizers and pesticides should be reasonably easy this year, with a good attitude being shown by farmers following an excellent growing season, with exception of some drought areas. In the Midwest, farmers have come up with good yields despite the cuts in acreage. Having been paid for the unplanted acres, and on top of that, having an over-all yield approaching normal, should put buyers in an expansive mood.

In this kind of atmosphere, fall sales of fertilizers, in particular, should be improved over those of last year. The idea of getting plant food supplies ahead of the annual spring rush makes real sense, and more and more farmers are realizing that there is little to be gained by waiting.

Fertilizer suppliers should encourage their dealers to keep pushing fall sales not only to spread the annual tonnage over a greater number of months, but also to assure buyers of their getting the grade they want under unhurried conditions.



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MEETING MEMOS



Sept. 17-20—Canadian Agricultural Chemicals Assn., 9th annual meeting and conference, Mont Tremblant Lodge, Mont Tremblant, Quebec.

Sept. 24-27—American Institute of Chemical Engineers, 46th national meeting, Lake Placid Club, Lake Placid, N.Y.

Oct. 5-6—Sixth Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 9-10—Third Annual Agricultural Chemical Applicators' Conference for the Pacific Northwest, Chinook Hotel, Yakima, Wash.

Oct. 9-11—Western Agricultural Chemicals Assn., annual meeting, Hotel Claremont, Berkeley, Cal.

Oct. 12-13—Northeastern Fertilizer Conference, Chicopee, Mass.

Oct. 16-20—Fertilizer Section, National Safety Council, annual meeting, Pick-Congress Hotel, Chicago.

Oct. 25—Annual Conference on Chemical Control Problems, sponsored by National Plant Food Institute, Woodner Hotel, Washington, D.C.

Oct. 25-26—Association of American Fertilizer Control Officials, 15th annual convention, Woodner Hotel, Washington, D.C.

Oct. 27-Nov. 1—Exposition of Chemical Industries, 28th meeting, New York Coliseum, New York City.

Oct. 29-Nov. 1—National Agricultural Chemicals Assn., 28th annual meeting, Homestead Hotel, Hot Springs, Va.

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Letters to the Editor

To the Editor:

The article in Croplife on the possibility of biological assault against United States agriculture is extremely interesting. It seems to me that you have rendered a service by calling attention to the potential danger of apathy in connection with the possibilities of biological warfare.

May I, however, call to your attention the statement in column 2, "No one has ever come up with the full answer about how . . . 15B got started in this country." The suspicion has been expressed a number of times that 15B may have been introduced by design. There is no evidence whatsoever for this. In fact there are more virulent races of rust which are well known and accessible to unfriendly peoples, and I am sure that they would have introduced one of these races rather than 15B.

In reality, the history of race 15B and its sudden explosion in 1950 are quite clear. From the time that 15B was first definitely identified in the United States, in a collection of rust from barberry bushes in central Iowa in 1939, the Federal Rust Laboratory at St. Paul was apprehensive that it might eventually spread and become independent of barberry. This statement was made repeatedly in publications, and we even started to develop varieties resistant to 15B several years before it became prevalent, in the expectation that it sometime would become prevalent.

The particular reason why 15B suddenly flared up in 1950 is also well known. Without going into detail, a very unusual combination of wind and weather during the growing season of 1950, during the fall of the same year, and during the winter of 1950-51 not only permitted the widespread dissemination and establishment of this race of rust but also enabled it to become independent of the barberry, where it had been found fairly commonly for a number of years without having become established in Mexico and southern United States.

Among others, I have been very much concerned about the possibility of biological warfare against food crops. It is true that our enemies could do us a great deal of harm by introducing virulent races of cereal rusts and other plant pathogens and of insect pests. As concerns the plant disease organisms, however, and more specifically the cereal rusts, they either have not tried it as yet or they have not succeeded if they did try it.

E. C. Stakman, Collaborator,
Cooperative Rust Laboratory,
U.S. Department of Agriculture,
University of Minnesota,
St. Paul, Minn.

Mexican Fertilizer Plant Begins Operations

Operations have begun at the Mexican nitrogen plant at Minatitlan, Vera Cruz, according to reports from Mexico City. The firm, Fertilizantes del Istmo, says it has started up the first unit of six eventually to comprise the complete complex. The units will turn out nitric acid, urea, processed urea, urea crystals, sulfuric acid, phosphoric acid, and high-analysis fertilizers.

Emilio Almada, president of the firm, said his plants will ultimately eliminate Mexican imports of these types of fertilizer and will start the country on large-scale export of chemical fertilizers to the U.S. and to other countries.

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Classified advertisements accepted until the fifth of each month for that month's issue.

Rates: 20¢ per word; minimum charge \$3.00. Situations wanted, 15¢ a word; \$2.25 minimum. Count six words of signature, whether for direct reply or keyed care of this office. If advertisement is keyed, care of this office, 25¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of \$12 per column inch. All Want Ads cash with order.

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ONE FARGUBAR MODEL 341 UNDER-car unloader, in good condition—make offer. Dorchester Fertilizer Co., Cambridge, Md.; Phone AC8-2800.

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Prefer individuals with agricultural training and sales experience.

Send confidential resume including academic background, work experience and salary requirements to:

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How to buy Anhydrous Ammonia and Nitrogen Solutions

by George Day

About the Author. Twenty-four years' experience serving customers are George Day's qualifications for writing about buying and selling an industrial commodity. For the last six of his 24 selling years, George has been working with customers who buy Ammonia and Nitrogen Solutions.

* * *

In the purchase of NH₃ and Nitrogen Solutions, look for a supplier with a good reputation. This kind of supplier has built up his good name probably over many years at great expense and he has a strong desire to

see that this good name is preserved. When this is the case, it is the buyer who benefits.

Being a good supplier includes all of the routine things expected of such a source—the keeping of promises, dependable deliveries, quality that meets or exceeds specifications, etc.

However, there is much more to a good reputation. There is the matter of having the initiative to go beyond the routine, plus the willingness to do a little more than is necessary to get the business. Superior traffic know-how is among these. Being able to let a customer know

exactly when to expect delivery, and knowing intimately the routing and timing of shipments are items to look for when deciding on an Anhydrous Ammonia and Nitrogen Solutions supplier.

Perhaps I wouldn't list these suggestions for selecting a supplier if I hadn't seen from experience how much they mean to our customers.

* * *

Would you like this kind of help with your purchases of Anhydrous Ammonia and Nitrogen Solutions? Call American Oil Company.

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